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**AN INVESTIGATION OF HOW ELEMENTARY SCHOOL TEACHERS
MAKE DATA-DRIVEN INSTRUCTIONAL DECISIONS IN LITERACY**

A Dissertation
Presented to the
Faculty of
San Diego State University

In Partial Fulfillment
of the Requirements for the Degree
Doctor
of
Education

by
Cheryl Carangian Pham
Spring 2011

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DEDICATION

Big dreams begin with a dreamer.

This is dedicated to my husband, Ray,
and my daughter, Ryan Quinn,
for believing in my dreams.

ABSTRACT OF THE DISSERTATION

An Investigation of How Elementary School Teachers Make Data-driven Instructional Decisions in Literacy

by

Cheryl Carangian Pham

Doctor of Education

San Diego State University, 2011

The purpose of this mixed methods phenomenological study was to explore the data-driven instructional decisions that elementary teachers make in literacy. Educators have moved towards a culture of being data-driven, and have declared data use in schools to be significant to school improvement and accountability. Yet, as school districts make great strides in creating a culture of data-driven decision making – collecting, analyzing and interpreting data – little is known about how individual teachers make sense of data and how they use the data to inform instruction.

To explore the data-driven instructional decisions made by classroom teachers using literacy assessment data, multiple measures including a web-based survey, stratified random sampling for structured interviews, and videotaping of grade level data team meetings were utilized to investigate areas that influence data-driven instructional decision making: teachers' experience, knowledge and beliefs about literacy and literacy assessments most useful to teachers. This study also explored how teachers determine interventions for a group of students and individual students, whether data-driven decision making differences exist between K-2 (primary) and 3-5 (upper) teachers, and types of data-driven decision-making models used when analyzing literacy data.

The findings of this study demonstrated that teachers shared common beliefs about the role of data in teaching, placed more value in common formative assessments, and identified strategies for student intervention based on their perceptions of the data. While findings of this study also demonstrated the need for teachers to want to align curriculum, instruction, and assessments, findings also indicated that teachers still perceived standardized testing items as important. Furthermore, key finding demonstrated that teachers' knowledge of assessment and literacy do influence decision making, and that while data-driven differences do exist among K-2 (primary) and 3-5 (upper) teachers, teachers employed the use of data-driven decision making models or behaviors that included transforming data into actionable knowledge to improve student learning and instructional decision making.

The findings from this study contributed to the literature on teachers' instructional decision making and data-driven decision making. Recommendations for future practice include supporting data use in schools by building teacher capacity in assessment and data analysis. The findings of this study will have implications for districts and schools using student assessment information to inform instruction in order to better serve students at every level.

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CHAPTER 1

INTRODUCTION

Major reforms in public education resulting from No Child Left Behind have led to a renewed interest in assessment for accountability and assessment to inform instruction. Educators have moved towards a culture of being data-driven, and have declared data use in schools to be significant for school improvement and accountability (Marsh, Pane, & Hamilton, 2006). Yet, as school districts make great strides in creating a culture of data-driven decision making – collecting, analyzing and interpreting data – little is known about how individual teachers make sense of data and how they use the data to inform instruction.

PURPOSES OF THE STUDY

The purposes of this study were to discover the ways in which teachers at the elementary level use multiple types of literacy data, and to investigate the types of decisions teachers made with the data to accelerate student achievement in literacy. Theories of data-driven decision-making and instructional decision-making in literacy framed the study.

This study explored the data-driven instructional decisions that classroom teachers made in literacy. Four main research questions guided this study:

1. In what ways do teachers' experience, knowledge of literacy and beliefs about literacy instruction influence teacher decision-making?
2. How do teachers make data-driven instructional decisions in literacy?
 - a. What literacy assessment information do teachers find useful and use more often?
 - b. How do teachers determine interventions for a group of students and individual students based on data?
 - c. What kinds of interventions do teachers identify?
3. What data-driven decision making differences exist between primary (K-2) and upper (3-5) grade teachers?
4. What decision-making models do teachers use when making data-driven instructional decisions in literacy?

STATEMENT OF PROBLEM

Major reforms in public education dating back from the 1950's have kept student achievement at the forefront of education. Literacy, in particular, has become the focus of legislative and political policy initiatives surrounding standards-based education, assessment, and accountability. Consequently, such initiatives have placed increasing pressure on schools to improve the way literacy is taught, as well as improving reading test scores. Understandably, literacy in kindergarten through grade three has been a primary focus of these initiatives with changes in teacher credentialing programs, funding opportunities, and class size reduction (California Department of Education, 2008). Congress' creation of the National Reading Panel (2000) endorsed the idea that a comprehensive and balanced reading program with an emphasis on phonemic awareness, phonics, fluency, comprehension, teacher education and reading instruction was necessary for effective reading instruction (National Reading Panel, 2000).

Congress' No Child Left Behind Act of 2001 added data-driven decision making to the weight of literacy instruction, assessment and accountability by requiring districts and schools to use data to measure progress toward standards and for improving student achievement. Presently, President Obama's American Recovery and Reinvestment Act of 2009 and the reauthorization of the Elementary and Secondary Education Act (also known as No Child Left Behind) in 2011 reiterated the importance of data-driven decision-making through the use of high quality assessments and data analysis in schools as the leading indicator for educational reform. The creation of the economic stimulus package, The American Recovery and Reinvestment Act of 2009 (ARRA), places data-driven decision making at the forefront of education by providing funding to districts and schools to increase student achievement through data-driven school improvement and reform. Part of this reform outlines the potential uses of the recovery funds, including, the use of valid and reliable assessments, data warehousing systems to assist in the collection data, and teacher professional development on the use of data to inform instruction (California Department of Education, 2008).

Leading the initiative, Secretary of Education, Arne Duncan (2009) has made data-driven decision making a federal and educational priority by declaring that data use in schools is the roadmap to reform. The educational agenda should focus on providing schools

with a way to examine student progress and teach educators how to read data and use the data to make informed decisions about students. Race to the Top, the federal grant competition, is a major effort by the administration to create data rich cultures in schools. The competition encourages states to build comprehensive data systems that measure student success and inform teachers and principals about how they can improve their practices.

As a result of such initiatives, the education community has witnessed increased interest in data-driven decision making. Yet, little is known about how classroom teachers make sense of data and how they use the data to inform instruction. The big assumption underlying data use in schools is that results from state, district and local assessments will be used to enhance decisions about how to allocate resources and improve student learning and classroom practice. (Ikemoto & Marsh, 2007; Ingram, Louis, & Schroeder, 2004). However, Hess (2009) argues that, “Data-driven decision making does not simply require good data; it also requires good decisions (p. 17).” Similarly, Ikemoto and Marsh (2007) state, “These calls for data-driven decision making often imply that data use is a relatively straightforward process. As such they fail to acknowledge the different ways in which practitioners use and make sense of data to inform decisions and actions” (p. 105). While educators proclaim to be data-driven, systematically collecting and analyzing various types of data to guide a range of decisions to help improve student achievement, results from a recent RAND report investigating the types of data available to administrators and teachers, and the factors influencing data use, conclude that data-driven decision making does not guarantee effective decision making (Marsh et al., 2006).

And while data use in schools has played a prominent role in district efforts to provide systematic change and improve literacy achievement, these efforts assume that those closest to the students—the classroom teachers, are fully equipped with a repertoire of approaches and skills in data analysis and know how to use the data to improve student learning. The importance of teachers knowing how to use assessment data to improve student learning cannot be overestimated. A growing body of research suggests that the use of high-quality assessment data, in the hands of classroom teachers trained how to use it effectively, can improve instruction (Protheroe, 2001). Similarly, Fullan, Hill, and Crvola (2006) contend that, in order to improve the effectiveness of classroom instruction so that it more precisely responds to the needs of students, teachers need to become proficient in using

assessment to monitor and manage student learning. The notion is that by supporting teachers with effective data analysis use, they can make informed decisions about instruction.

Given the weight of data-driven decision making on classroom teachers, Protheroe (2001) argues that, “finding good data and using it effectively is actually a complex process—one that many schools and districts are just beginning to address” (p. 1). Stiggins (2002) contends that it is essential for schools to build an assessment literate faculty and focus on effective data analysis use.

THEORETICAL FRAMEWORK

The literature on teacher decision making traces back to the 1920’s with one of the first attempts investigating the accuracy of teachers’ judgmental processes. In Varner’s classic 1923 study on the accuracy of teachers’ ratings of students’ intelligence, Varner concluded that teachers’ judgments of students’ intelligence were indeed accurate. Fifty years later, present-day models of teachers’ judgments and pedagogical decisions have contributed to our understanding and analysis of teachers’ decision-making or cognitive thought processes. The works of Shavelson and others have characterized decision making as being pervasive in teaching, and that decisions are involved in almost every aspect of a teacher’s professional life, especially in planning, implementing, and evaluating instruction. Their work has advanced the position that teachers’ decision making is of significance, revealing that teacher decisions are indeed reasonable or rational and intended to optimize student outcomes or achievement. Results from the studies have concluded that teachers are seen as active agents or intuitive statisticians with the ability to use many instructional techniques or strategies at their disposal to improve student achievement (Shavelson, 1976; Shavelson, Cadwell, & Izu, 1977; Shavelson & Stern, 1981; Shulman & Elstein, 1975).

Research on teachers’ thought processes focus on teacher behaviors related to the classroom, particularly on how the teacher acts or performs in the classroom. Such studies of teachers’ human cognitive behavior in the classroom have dominated the field. Shulman and Elstein’s (1975) work sought to represent teachers’ preactive or planning and interactive thought processes, as teachers make instructional decisions during planning and when interacting with students in the classroom. In their work, they have characterized teachers as problem solvers, information processors, and decision makers.

Moreover, the literature on teachers' instructional decision making concludes that teachers' conceptions of subject matter highly influence teachers' instructional decision making (Shavelson, 1983; Shavelson & Stern, 1981). Frey and Heibert (2003) would agree that, when it comes to literacy, "the basis of teacher assessment is necessarily linked to the teacher's vision of literacy" (p. 609). Therefore, teachers' knowledge and beliefs about literacy play a significant role in the types of assessment information teachers use and what they do with the assessment information. More importantly, teachers' knowledge and beliefs about literacy have implications for providing effective or ineffective reading instruction and for diagnosing student reading abilities.

SIGNIFICANCE OF THE STUDY

Researchers who championed the investigation of effective schools and the characteristics associated with high levels of teaching and student achievement have found that schools that support data use by establishing data-driven decision making models to improve teacher practice and student learning show remarkable performance in teaching and learning (Cicchinelli, Dean, Galvin, Goodwin, & Parsley, 2007; Guskey, 2007; Stiggins, Conklin, & Bridgeford, 1986).

Moreover, measurement or assessment research concludes that assessment is an integral part of the classroom environment. As both large and small scale districts pour millions of dollars into comprehensive, integrated data warehouses promising to provide schools with easy, timely access to multiple assessment data, the current reality for many schools is that the problem does not lie in a shortage of data, but that schools are actually drowning in data (DuFour & DuFour, 2008; Reeves, 2008). Unanswered questions remain about the type of literacy data most meaningful to classroom teachers and how classroom teachers interpret and use the data to make instructional decisions about students. This study will contribute to the field of teacher decision making in literacy by investigating how teachers use data for instructional purposes and improved student performance. Stiggins et al. (1986) argue, "Until we understand assessment in the teacher's world in terms relevant to the teacher and translate our concepts into those terms, we will remain unable to alter teachers' perceptions of either the validity or the relevance of those concepts" (p. 15).

DESIGN OF STUDY

To explore the data-driven instructional decisions made by classroom teachers using literacy assessment data, this was a phenomenological study in which multiple measures including a web-based group administered survey, stratified random sampling for structured interviews, and videotaping of grade level data analysis team meetings were used. Twenty-seven teachers participated in the survey. Of the 27 teachers, stratified random sampling was used to select six classroom teachers, two from grade one, two from grade three, and two from grade five, to participate in structured interviewing. A process tracing approach was used as the primary method during the interviews to reveal teachers' data-driven instructional decision making. Using this approach, participants were asked to "think aloud" while performing the task of analyzing data to reach a decision (Shavelson, 1983). The process in which teachers evaluated student performance in literacy and reached a decision about instruction and intervention will be analyzed. While this approach is not traditionally used in measurement or assessment research, scholars in this field suggest that this type of approach would uncover the answers to teachers' data-driven decision making (Stiggins et al., 1986). Of the 27 teachers, five first grade teachers, five third grade teachers, and four fifth grade teachers, participated in videotaped grade level data team meetings. The findings have implications for districts and schools using student assessment information to inform instruction to better serve students at every level.

LIMITATIONS OF THE STUDY

Limitations to this study include population validity, the relationship of the researcher with the participants, and the types of literacy assessments utilized for the study instruments.

This was a single school study in one school district with 27 participants in the study. Of the 27, six participants were selected, using stratified random sampling, to participate in interviews on three separate occasions. Qualitative data collected from the videotaped grade level data team meetings were limited to one videotaped session rather than multiple sessions. Therefore, the ability to generalize the findings to a larger population is reduced.

The researcher was currently a Literacy Resource Teacher at the research site who provided professional development to teachers and literacy intervention to students who were

not meeting grade level standards. She also attended and facilitated Professional Learning Communities.

The types of literacy assessments used in the survey instrument did not include phonics assessments, but focused on phonemic awareness instead. To provide a more accurate picture of students' literacy needs, both types of assessments are important.

DEFINITION OF TERMS

Academic performance index (API): An important component of the California's Public Schools Accountability Act (PSAA). The API measures the academic performance and growth of schools on a variety of academic measures. Schools receive a yearly API ranking score based on performance on California Standardized Test (California Department of Education, 2008).

Adequate yearly progress (AYP): A statewide accountability system mandated by the No Child Left Behind Act of 2001 which requires each state to ensure that all schools and districts make Adequate Yearly Progress (California Department of Education, 2008). One of three components of California's Public Schools Accountability Act (PSAA), AYP measures a school's performance for significant subgroups in the areas of participation rate, student proficiency in literacy and math, and graduation rate. Schools receive a yearly AYP growth target score which they must meet or otherwise face program improvement status (California Department of Education, 2008).

California standards test (CST): An annual large-scale assessment that is a major component of the Standardized Testing and Reporting (STAR) program. The CSTs were developed by California educators and test developers specifically for California. They measure students' progress toward achieving California's state-adopted academic content standards, which describe what students should know and be able to do in each grade and subject tested. Students in grades two through eleven annually take multiple-choice CSTs in various subjects (California Department of Education, 2008).

California standards test (CST) blueprint: The California Standards Tests (CSTs) in English-language arts (ELA) provide a blueprint (public document) for each grade. As the blueprints indicate, the ELA CSTs for grades two and three consist of 65 multiple-choice questions with an additional 6 field-test questions. For grades four through eleven, the tests

consist of 75 multiple-choice questions with an additional 6 field-test questions. At grades four and seven, the ELA CSTs also include a writing component, the California Writing Standards Test, which addresses a writing applications standard selected for testing each year. The blueprint indicates the number of items or the numbers of questions testing each standard as well as the total number of questions for each strand, as well as the percentage of questions assessing each strand. Teachers often use the blueprint to identify heavily-weighted items on the CST (California Department of Education, 2008).

Formative assessments: Traditionally referred to as pretests or pre-assessments and posttests or post-assessments generated by classroom teachers. Formative assessments are given to students before formal instruction occurs, during instruction to gauge student progress, and again at its conclusion. These assessments are primarily used to inform instruction. Exit slips and quizzes are examples of formative assessments (Ainsworth & Viegut, 2006).

Common formative assessments: Designed by classroom teachers, either grade level teams or course/department teams who teach the same content standards to their students, using a pre-post-design. Often, these assessments are directly linked to specific standards. (Ainsworth & Viegut, 2006).

Data-driven decision making (DDDM): A process of systematically collecting various types of assessment data and analyzing the data to guide a range of decisions to help improve student achievement (Ikemoto & Marsh, 2007; Ingram, Louis, & Schroeder, 2004)

Diagnostic assessments: Assessments used to identify placement for intervention or special programs for struggling students in need of specialized targeted instruction (Fisher & Frey, 2008)

Indicators: Early signals of progress toward academic achievement. Indicators educators to make more strategic, personalized decisions about services and supports to improve student learning (Foley et al., 2008).

Process tracing: An approach used to explore teachers' mental processes such as thoughts and judgments by asking participants to "think aloud" while performing a task, solving a problem or reaching a decision (Shavelson, 1983).

Power standards: The Power Standards are essential standards fundamental for students to be successful, and include lifelong endurance, leverage across multiple disciplines, and readiness for the next level of learning (Ainsworth & Viegut, 2006).

Professional learning communities (PLC): A staff development approach meant to provide teachers with structure for collaboration, depth in learning, mutual accountability and interdependence, and relevance to classroom application. Four questions guide the work of PLCs: (1) What is it we expect students to learn?; (2) How do we know they learn?; (3) How do we respond if they don't learn?; (4) How do we respond if they do learn? Moreover, an essential component of professional learning communities involve teachers working in "data teams," creating, gathering, and interpreting assessments, while establishing and monitoring S.M.A.R.T. goals to enhance student learning and teaching (DuFour, DuFour, Eaker, & Many, 2006).

S.M.A.R.T. goals: A systematic process used in professional learning communities to establish goals for teaching and learning. S.M.A.R.T. goals guide decisions about assessment data by focusing on **S**trategic, **M**easureable, **A**ttainable, **R**elevant, and **T**ime bound goals for student achievement (DuFour et al., 2006).

Summative assessments: Assessments administered at the end of a unit, quarter, course, semester, trimester, or academic school year. These assessments report the final results of student learning typically to support the assignment of letter grades or levels of proficiency. Annual standardized tests such as CST and district benchmarks administered after every quarter are examples of summative assessments (Ainsworth & Viegut, 2006).

Think Aloud Method: Asking participants to verbalize the thoughts in their head as they engage in an activity, solve a problem or make a decision (Young, 2005).

CHAPTER 2

REVIEW OF LITERATURE

The purposes of this study are to investigate and describe the ways in which teachers at the elementary level use multiple types of literacy data, and to investigate the types of decisions teachers make with the data to accelerate student achievement in literacy. The literature review is divided into four sections. The first section provides an overview of accountability. Section two provides an overview of data-driven decision making. Section three provides an overview of reading instruction, reading assessment, and teacher knowledge or competency in assessment. The last section provides an overview of teachers' instructional decision making and their use of student assessment data in literacy to improve student achievement.

HISTORY OF ACCOUNTABILITY

On October 4, 1957, the launch of the first satellite into the earth's orbit changed our nation's educational landscape. Remarkably, Sputnik, the Russian satellite, created both paranoia and concern for America—it became obvious to all that the soviets had outperformed America in science, math and technology. Russia's victory resulted in the call for educational reform in the United States. Leading the movement was our nation's scientific community who called for better practices in preparing students in science, math, and technology. In response, the federal government stepped in and authorized the National Defense Education Act in 1958, which poured more than a billion dollars into educational reform (Abramson, 2007).

Several years later, in an effort to show its continued commitment to educational improvement and change, the federal government created the Elementary and Secondary Act of 1965, which distributed additional funding into primary and secondary education with the purpose of improving student achievement. Since its groundbreaking enactment, the federal government has continuously reauthorized the Act, and its current reauthorization echoes in the halls of every classroom in the nation, calling for no child to be left behind.

ELEMENTARY AND SECONDARY EDUCATION ACT (NO CHILD LEFT BEHIND)

The No Child Left Behind Act (NCLB) of 2001 was intended to solve our nation's complex student achievement shortfalls by calling for increased standards-based reform and standards of accountability for states, school districts and schools. NCLB was the beginning of a new system of accountability. One significant aspect of this reform was the establishment of its primary goal, to have all students proficient in English language arts and mathematics by 2014. According to NCLB, each state must ensure that all schools and districts meet a series of annual academic performance goals or Adequate Yearly Progress (AYP). To demonstrate progress, the AYP measures an individual school's performance for numerically significant subgroups in the areas of participation rate in testing, percent proficient in English language arts and math as measured by annual assessments, and graduation rate. Moreover, schools receive a yearly AYP growth target score, which they must meet, or exceed, or otherwise face accountability sanctions such as program improvement status (California Department of Education, 2008). In 2011, NCLB was reauthorized by President Obama.

The government's unprecedented interest in education, and its extraordinary economic power in providing schools with funding, is rooted in the information age or knowledge economy literature that posits that "if knowledge is the greatest source of wealth, then individuals, companies and nations should invest in the assets that produce and process knowledge" (Stewart, 1997, p. 31). This investment in "knowledge" began with a massive effort to improve education with the launch of Sputnik. The advantage of investing in our nation's assets cannot be argued. Moreover, determining the "assets" of our nation is simple. One can glance into any classroom across the nation and witness our knowledge workers—the classroom teachers. While this investment stands as a much debated legislative, political, and economic move, its impact on changing the way literacy is taught and how teachers make decisions about accelerating student achievement in literacy remains unclear.

The greatest challenge today facing the federal government is evaluating the return on its investment by determining how well students are actually performing. As revealed earlier, at the heart of NCLB is its continued system of accountability. For a system of continuous improvement or reform to work, monitoring and measuring student progress is necessary. On

a larger scale, one can take a look at the National Assessment of Educational Progress (NAEP) or the “Nation’s Report Card,” sponsored by the U.S. Department of Education beginning in 1969, as a way to track and measure student performance over time. The NAEP is the only nationally representative and continuing assessment of what America's students know and can do in various subject areas. While not all students or subjects are assessed each year, NAEP’s purpose is to measure and determine student achievement in the United States, particularly for fourth-, eighth-, and twelfth-graders over time. Assessments are conducted periodically in mathematics, reading, science, writing, the arts, civics, economics, geography, and U.S. history (National Center for Education Statistics, 2009).

On a smaller scale, evaluating what students know and can do remains at the core of NCLB and its test-based accountability system. At the state level, in California, for example, schools and teachers are accountable for improving student achievement in state-adopted academic content standards. In 1999, California established the Public Schools Accountability Act (PSAA) that includes a Standardized Testing and Reporting (STAR) system. The STAR includes the California Standards Test that measures students' progress in various subjects in grades 2-11 toward achieving California's state-adopted academic content standards. These describe what students should know and be able to do in each grade and subject tested. An important component of the PSAA is an annual Academic Performance Index (API) that is used to measure a school’s growth and progress on a variety of academic measures (California Department of Education, 2008).

“Standards-based accountability policies that include high-stakes testing are currently the dominant school reform approach in the United States. These policies are designed to raise students’ educational outcomes and reduce race and class achievement gaps by linking students’ test scores to rewards and sanctions for both schools and students” (Diamond & Cooper, 2007, p. 241). Guskey (2007) maintains that, “Policy makers and legislators at the state and national levels see assessments as essential for change. They believe that good data on student performance drawn from large scale assessments will help focus educator’s attention and guarantee success” (p. 15). Moreover, Schmoker (2000) argues that, “Standardized test results have provided the essential focus and urgency for schools to improve and refine instructional programs in reading, writing, and math practices” (p. 64).

Reeves (2008) maintains that a comprehensive accountability system is necessary for effective decision-making.

In sum, the success of launching a Russian satellite into the earth's orbit generated an unprecedented interest in education. Since then, it has been the intention of our federal government to invest in our nation's future by pouring billions of dollars into school improvement with the belief that such an investment will strengthen the intellectual capital of our nation. While the federal government should be applauded for its efforts to revitalize and prioritize education, such involvement comes with a price. One would be hard-pressed to find a single school district, school or classroom teacher for the past ten years unaffected by No Child Left Behind's standards-based reform and standards of accountability.

DATA-DRIVEN DECISION MAKING

Not surprisingly, recent policy initiatives associated with standards-based education, assessment and accountability have placed increasing pressure on schools to improve test scores. Congress' No Child Left Behind Act of 2001 added data-driven decision making to the weight of assessment and accountability. As a result, the education community has witnessed increased interest in data-driven decision making as the way to improving student achievement. Yet little is known about the how classroom teachers make sense of data and how they use the data to inform instruction. Scholars have raised concerns about data use and misuse in schools. The big assumption underlying data use in schools is that results from state, district and local assessments will be used to make decisions about students and instruction (Ingram et al., 2004). However, Hess (2009) argues that, "Data-driven decision making does not simply require good data; it also requires good decisions" (p. 17). While educators claim data-driven decision making, systematically collecting and analyzing various types of data to guide a range of decisions to help improve the school, results from a recent RAND report investigated the types of data available to administrators and teachers, along with the factors influencing the use of data for decision-making. The report suggested that data-driven decision making does not guarantee effective decision making unless teachers understand how to analyze data (Marsh et al., 2006).

While data use in schools has played a prominent role in district efforts to provide systematic change and improve student learning, these efforts assume that those closest to the

students, our knowledge workers – the classroom teachers – are fully equipped with a repertoire of approaches and skills in data analysis to make sense of various types of data and in using such information to improve student learning. The importance of teachers knowing how to use assessment data to improve student learning cannot be overestimated if data-driven decision making is to succeed.

A growing body of research suggests that the use of high-quality assessment data, in the hands of classroom teachers trained how to use it effectively, can improve instruction (Protheroe, 2001). Similarly, Fullan et al. (2006) contend that in order to improve the effectiveness of classroom instruction so that it more precisely responds to the needs of students, teachers need to become proficient in using assessment data to monitor and manage student learning. The notion is that by supporting teachers with effective data analysis skills, they can make informed decisions about instruction.

As mentioned in Chapter 1, given the weight of data-driven decision making on classroom teachers, it is important that classroom teachers have the necessary skills in data analysis (Protheroe, 2001). Stiggins (2002) agrees with the need to build an assessment-literate faculty and focus on effective data analysis use.

MODELS OF DATA-DRIVEN DECISION MAKING

The creation of data-driven cultures in educational institutions is on the rise as districts and schools across the nation proclaim themselves to be data-driven. Understandably, one consequence of the standards and accountability movement is that district and school administrators are being asked to think differently about educational decision making and to use data to inform everything from budgetary and resource allocation, to professional development needs, to instructional practice. The No Child Left Behind Act of 2001 added data-driven decision making to the weight of assessment and accountability by requiring districts and schools to use data to measure progress toward standards and for improving student achievement. As a result, the education community has witnessed increased interest in data-driven decision making as the way to improving student achievement.

Historically, the role of gathering assessment data primarily focused on data generated by standardized testing. What educators now see is the use of multiple assessment

data to improve instructional decision-making. An important first step in understanding this new role of data use in schools requires a definition of data-driven decision making (DDDM) and its conceptual framework. The general definition of data-driven decision making (DDDM) refers to teachers, principals, and administrators systematically collecting and analyzing data to guide a range of decisions to help improve the success of students and schools (Ikemoto & Marsh, 2007).

Data-driven decision making suggests that the use of data will enhance the quality of school-based decision making and instructional practice because school leaders and teachers will use data to make better-informed decisions (Diamond & Cooper, 2007). It is important to note that DDDM is not new; in fact this process is modeled on successful practices from industry and manufacturing such as Total Quality Management, Organizational Learning, and Continuous Improvement, which emphasize that organizational improvement is enhanced by responsiveness to performance data over time. DDDM has its history in measurement-driven instruction in the 1980's (Popham, 1987; Senge, 1990); in state requirements to use outcome data in school improvement planning and site-based decision making processes dating back to the 1970's and 1980's (Massell, 2001); and in school system efforts to engage in strategic planning in the 1980's and 1990's (Schmoker, 2004).

Models of data-driven decision making have been developed in schools. All the models focus on transforming data into actionable knowledge to improve student learning and instructional decision making. One of the earliest models adapted from the work of Mandinach, Honey, Light, and Brunner (2008) sees DDDM as an iterative process, and describes the characteristics or skills educators need to be data-driven based on a data-to-knowledge continuum (see Figure 1).

This continuum suggests six skills crucial to the decision-making process. At the data level, individuals must *collect* and *organize* the data in a systematic way that makes sense; at the information level, individuals must *analyze* and *summarize* the data; and at the knowledge level, individuals must *synthesize* the information into usable knowledge. The final step is to *prioritize* the knowledge, which allows decision makers to determine what is most important, most pressing, or the most rational solution to a particular educational problem at a given time.

Figure 1. Data-driven decision making model based on a data-to-knowledge continuum. Source: Mandinach, E., Honey, M., Light, D., & Brunner, C. (2008). A conceptual framework for data-driven decision making. In E. Mandinach & M. Honey (Eds.), *Data-driven school improvement: Linking data and learning* (pp. 13-31). New York, NY: Teachers College Press.

The outcome of this six-step process, moving from data to information to knowledge, is a *decision* in which individuals implement an action plan, strategy or intervention to result in some sort of *outcome* or *impact*. However, depending on the impact, the individual may decide that he or she needs to return to one of the six steps, thereby creating a feedback loop, resulting in the need to collect more data, reanalyze the information, or resynthesize the knowledge. Because of this feedback loop, data-driven decision making is seen as an iterative process (Mandinach et al., 2008).

Such a model recognizes disparity across multiple contexts across various levels of the educational system: the classroom, school, and district, and the types of data collected and analyzed. However, one shortcoming of this model is that it fails to address the fact that DDDM in practice is not necessarily as linear or continuous as the model suggests.

Another model from Ikemoto and Marsh (2007) suggests that DDDM can vary along two continuums: the type of data used and the nature of data analysis and decision making (see Figure 2). This model suggests that in a DDDM process, educators can utilize a wealth

Figure 2. Simple to complex data-driven decision making model. Source: Ikemoto, G., & Marsh, J. (2007, August). Cutting through the “data driven” mantra: Different conceptions of data-driven decision making. *Yearbook of the National Society for the Study of Education*, 106(1), 105-131.

of different kinds of data that range from simple to complex. Therefore, the types of analyses and decision making also vary from simple to complex along the following dimensions:

- Basis of interpretation (use of assumptions versus empirical evidence)
- Reliance on knowledge (basic versus expert, such as consulting with advisors)
- Type of analysis (straightforward techniques, such as a descriptive analysis, versus sophisticated analyses, such as value-added modeling)
- Extent of participation (individual versus collective); and frequency (one-time versus iterative)

A given DDDM process can fall within one of four quadrants depending on the level of complexity along the two continuums. The four quadrants are basic (quadrant I), analysis-focused (quadrant II), data-focused (quadrant III), and inquiry-focused (quadrant IV). Basic DDDM entails using simple data and simple analysis procedures whereas inquiry-focused DDDM involves using complex data and complex analysis.

The work of Ikemoto and Marsh (2007), along with previous collected data from two studies conducted by the RAND Corporation, have identified examples of DDDM (see Table 1).

Another model of DDDM is “The Data Wise Improvement Process” developed by Boudett, City, and Murnane (2005). This model addresses the cyclical nature of data-driven decision-making and involves eight distinct steps with three major categories: Prepare, Inquire, Act in order to use assessment data effectively (see Figure 3).

The first stage of this model involves building an assessment literate faculty where teachers receive training on how to make sense of student assessment data and how to use the data to make instructional decisions or adjustments or modifications to instruction. Once these skills are in place, the inquiry phase begins where schools prepare data reports or profiles that include school wide data, grade level data, individual teacher data, student data and group data. Teachers then proceed to act on the reports by analyzing the data, examining instructional practices or strategies, and developing an action plan that focuses on SMART criteria to establish student achievement goals: **S**pecific, **M**easureable, **A**ttainable, **R**esults-oriented, and **T**ime bound. An essential component for developing an action plan is to determine student indicators as a means to monitoring and evaluating student progress along the way versus waiting until the end of the goal deadline. Once the goal deadline is completed, teachers administer a post-assessment to evaluate and reassess student progress toward achieving the established goal (Boudett et al., 2005).

Transforming data into actionable knowledge to improve student learning and instructional decision making requires a complex undertaking, even for the trained educator. Models of data-driven decision making are neither straightforward nor simple. However, the hallmarks of data fluency are understanding how data should be used, the interpretations that can be made from those data, and how such interpretations can be used to guide different types of decisions. For schools, a central component of this process is asking good questions about the data, analyzing the data accurately, and then applying the results appropriately (Mason, 2002).

Furthermore, Ikemoto and Marsh (2007) argue that, “despite the complexity of DDDM models, attention must be spent on the different ways in which practitioners use and make sense of data to inform decisions and actions” (p. 105). Similarly, given the weight of

Table 1. School Examples Illustrating DDDM Models

Quadrant: DDDM Models	DDDM School Examples
<p>Quadrant I: Basic</p>	<p><i>Example: Targeting Professional Development</i></p> <p>An elementary principal using a single data source such as state assessment data to identify poor performance in literacy. In response, the principal allocates funding to professional development and hires a literacy consultant to lead seminars on instructional strategies in the teaching of literacy.</p>
<p>Quadrant II: Analysis-Focused</p>	<p><i>Example: Using disaggregated data and expertise to adopt literacy curriculum</i></p> <p>An elementary principal and teachers disaggregate state assessment data to find patterns that might explain low literacy scores. Over a series of meetings, they engage in further data analysis and conclude that the school's curriculum is lacking. Responding to the data, the school develops supplementary materials.</p>
<p>Quadrant III: Data-Focused</p>	<p><i>Example: Deciding to allocate resources toward reading specialists.</i></p> <p>A school is awarded extra financial resources and draws on multiple data sources, including discipline data and feedback from parents. The school then makes the decision to hire two additional reading specialists.</p>
<p>Quadrant IV: Inquiry-Focused</p>	<p><i>Example: Improving capacity to support English language learners</i></p> <p>Leaders in a district notice that the low scores of ELL's were jeopardizing the district's ability to meet AYP. With the help of an external organization and district experts in ELL instruction, the district examines the underlying causes of poor ELL performance by developing a qualitative protocol to walk through the school's halls and classrooms to collect evidence on current teaching practices.</p>

(table continues)

Table 1. (continued)

Quadrant: DDDM Models	DDDM School Examples
	Walkthrough data suggests a lack of academic rigor, resulting in district implementation of professional development focusing on English language learners.

Source: Ikemoto, G., & Marsh, J. (2007, August). Cutting through the “data driven” mantra: Different conceptions of data-driven decision making. *Yearbook of the National Society for the Study of Education*, 106(1), 105-131.

Figure 3. Data wise improvement process model. Source: Boudett, K., City, E., & Murnane, R. (2005). *Data wise: Step-by-step guide to using assessment results to improve teaching and learning*. Cambridge, MA: Harvard Education Press.

data-driven decision making on classroom teachers, Protheroe (2001) argues that “finding good data and using it effectively is actually a complex process—one that many schools and districts are just beginning to address” (p. 1). Stiggins (2002) contends that it is essential for schools to build an assessment literate faculty and focus on effective data analysis use.

SUMMARY OF DATA-DRIVEN DECISION MAKING

A review of the literature suggests that teachers need guidance in translating data into useful information and that most teachers do not have formal training in assessment and data

literacy (Schafer & Lissitz, 1987; Wise, Lukin, & Roos, 1991). As previously noted, using data effectively is a complex process, but with proper training, data use can improve instruction (Protheroe, 2001). According to Stiggins et al. (1986), teachers spend an estimated one third of their professional time in assessment-related activities, and that many of these activities require skills in testing and measurement. In Schafer and Lissitz's (1987) meta-analysis of the literature surrounding measurement-training practices among educators, they revealed the complex skills or competencies necessary for assessment and data literacy. The following competencies were identified: construction, application, administration, and interpretation of classroom tests and evaluation of other instruments and statistics in relation to measurement. While teacher training in data fluency and assessment literacy has not been given the emphasis that its role in teaching demands, particularly in teacher preparation courses, schools and districts are now beginning to address this issue.

Sweeping into the schools and classrooms across the nation is the shift to data-driven professional development practices where teachers assess students, aggregate the data, and collaboratively meet to discuss assessment data results, with the end goal of using the assessment data to make adjustments to their teaching practices. A considerable body of research on the use of classroom assessment to promote student learning is well established in educational research (Black & William, 1998; Fullan et al., 2006; Hall & Harding, 2002; Tierney, 2006).

While the strategic use of assessment data are necessary for increasing student achievement, many studies have noted that it is the expertise of the classroom teacher that is a determining factor in the teaching of reading and continued literacy achievement (Block, Oakar, & Hurt, 2002). As a result, school leaders have been called to create professional development structures that support adult learners in developing their teaching expertise. Fullan et al. (2006) propose that it is essential for schools to move toward a new reality in which diagnostic practitioners, who have a solid core of beliefs and understandings about teaching and assessment, develop highly personalized programs that match the needs of individual pupils. Research reveals that successful professional development structures require fundamental transformations in the learning cultures of schools. The work done by DuFour et al. (2006) on professional learning communities suggest that quality professional learning communities are not only data-driven, but also offer teachers collaboration and

choice in their own learning, depth in topic, involvement of all participants, and allowance for classroom application. Moreover, an essential component of professional learning communities involve teachers working in “data teams,” creating, gathering, and interpreting assessments to enhance student learning and teaching.

Data-driven professional learning communities represent a key foundation for effective schools, particularly when schools create common formative assessments, assessments created by teachers to inform student learning. The work done by Stiggins (2002) reveals that educators must create quality, accurate assessments that include a clear purpose for the assessment and a clear achievement target for what needs to be assessed, and, which accurately reflect the target and satisfy the purpose.

While little is known about how classroom teachers make sense of data and how they use the data to inform instruction, Diamond and Coopers’ (2007) work on data use in elementary schools among Chicago Public Schools revealed that data are used in distinct ways in schools with different contexts, depending on where schools are situated in relation to a school’s accountability status. More specifically, the findings revealed that schools that had high student achievement trends used testing data to guide school-wide, systematic instructional improvement broadly, for all students, across all grade levels, and relatively equally across the core subjects of mathematics and language arts. In contrast, in schools with low student achievement, testing data were used to devise strategies to avoid sanctions and raise student achievement quickly by targeting their resources on a narrow range of students and grade levels, and toward one of the core subjects (either math or reading) in order to demonstrate rapid gains in students’ test scores.

In another related study, Johnston, Afflerbach, and Weiss (1993) examined 50 elementary schools selected from three contexts representing a range of technical and bureaucratic control over teachers’ literacy instruction. Their study revealed that context or the political conditions under which teachers work plays a role in how teachers assess students in literacy, and that teachers’ subject knowledge in literacy play a role in how students are assessed. The study was composed of teachers selected from three contexts: (1) a high-control district where teachers were required to utilize the state-adopted basal reading program in fidelity, and administer end-of-unit assessments, (2) a low control district where teachers were required to develop their own literacy assessment techniques rather than using

the basal reading program, and (3) a more flexible district where teachers were required to self-select their reading program and assessments.

Results revealed that teacher' knowledge and expertise in subject matter influence how they assessed students in literacy and that the primary source of student achievement or proficiency in literacy was teacher observation of student behavior and student talk. Results revealed how context or the conditions under which teachers worked influenced both assessment techniques and teachers' descriptive assessments of their students. For example, teachers from the high-control districts emphasized tests, competitive attainment, and test-like language, and turned to tests for feedback about students and their teaching effectiveness.

In sum, data use in schools does exist. However, the role of accountability influences the type of data teachers use when assessing student literacy achievement. Moreover, teacher's subject matter expertise in literacy has implications for how teachers assess students in literacy.

REFORMS IN READING INSTRUCTION

Major reforms in public education dating from the 1950's have kept student achievement at the forefront of education. Literacy, in particular, has become the focus of legislative and political policy initiatives surrounding standards-based education, assessment, and accountability. As a result, these initiatives have placed increasing pressure on schools to improve the way reading is taught, and to raise reading test scores. Understandably, literacy in kindergarten through grade three has been a primary focus of these initiatives with changes in teacher credentialing programs, funding opportunities, and class size reduction (California Department of Education, 2008).

EFFECTIVE READING INSTRUCTION

In 1997, Congress asked the Director of the National Institute of Child Health and Human Development (NICHD), along with the Secretary of Education, to convene a national panel on reading to assess the status of research-based knowledge about reading, including the effectiveness of various approaches to teaching children to read. The National Reading Panel analyzed over 100,000 research studies and concluded that an emphasis on phonics, phonemic awareness, fluency, vocabulary and reading comprehension strategies were

essential in reading instruction (National Reading Panel, 2000). Over the years, these five components have been characterized by schools as indicators for student literacy achievement with the purpose of assessing students' reading skills.

One of the most compelling findings from other reading research is that children who lack the foundational skills in early reading, continue to struggle in their reading acquisition (Torgesen, 1999). Stanovich (1986) coined the term "The Matthew Effect" to describe what happens: early success in acquiring reading skills usually leads to later successes in reading as the learner grows, while failing to learn to read before the third or fourth year of schooling may be indicative of life-long problems in learning new skills.

Given that children are different not only in their interest and backgrounds, but also in terms of their literacies and acquisition of literacy development, scholars and educators argue for reading instruction and assessments that involve multiple measures of student indicators for literacy achievement. These measures are formative and diagnostic, and adaptive to the changing needs of students' literacy development and instructional opportunities (Campbell, 2001; Tierney, 1998).

The importance of indicators as predictors of literacy achievement has been established in the literature. Indicators are defined as early signals of progress toward academic achievement and enable educators to make more strategic, personalized decisions about services and supports needed to improve student learning. According to the Annenberg Institute for School Reform, "Education leaders and community members need a way of examining their schools and school systems that allows them to understand when (and whether) progress is being made *before* the results show up in indicators like student test scores" (Foley et al., 2008).

OVERVIEW OF ASSESSMENT IN LITERACY

Earlier, it was noted that the role of gathering assessment data primarily focused on ranking schools and students for the purposes of accountability. Scholars in the field of assessment would argue that this type of assessment use represents a very limited view of assessment and refer to its use as "assessment *of* learning." Moreover, such scholars would argue that while large-scale or external assessments are necessary for accountability, the real focus should be on "assessment *for* learning," where individuals use assessments to improve

teaching, learning, and instructional decision-making. (Ainsworth & Viegut, 2006; Black & William, 1998; Guskey, 2007; Reeves, 2008; Stiggins, 2002).

Educators have raised concerns over the emphasis on conventional standardized external assessments meant to provide valid and reliable summative data on student achievement. Such opponents argue that no single assessment can cover all the purposes of tests and evaluations, particularly in literacy (Meisels & Piker, 2001). Given that children are different not only in their interest and backgrounds, but also in their literacies and acquisition of literacy development, scholars and educators argue for more teacher directed, curriculum-embedded assessments that involve multiple measures, that are formative and diagnostic, and are adaptive to the changing needs of students' literacy development and instructional opportunities (Campbell, 2001; Tierney, 1998). Whereas “assessments *of* learning” are necessary to some degree, “assessments *for* learning” directly impact student learning and instructional decision-making.

According to Fisher and Frey (2008, Chapter 3), assessments are used in school to:

- Assist in student learning
- Identify students' strengths and weaknesses
- Assess the effectiveness of a particular instructional strategy or the effectiveness of curriculum programs
- Assess and improve teaching effectiveness
- Provide data that assist in decision making

Three types of data widely used in schools are summative assessment data, formative assessment data, and diagnostic assessment data. The most common summative assessment is a statewide standardized test, administered annually to students in the areas of English Language Arts and Mathematics. The purpose of this assessment is to measure student proficiency on grade-level content standards. Summative assessments are also administered periodically to determine at a particular point in time student performance, such as district benchmark assessments administered quarterly to measure and monitor student proficiency on grade-level content standards taught throughout the year.

Formative assessments are aligned to ongoing classroom instruction. For example, if a class is studying literary devices, a formative assessment might explore a student's ability to recognize these devices and to use these devices in writing (Fisher & Frey, 2008).

Formative assessments are administered more frequently, such as weekly or monthly, and can include quizzes, projects, and written assignments. The purpose of this type of assessment is to inform teachers of student progress and areas of need, which allows teachers to make adjustment to their teaching practice and provide additional targeted individual and group support. Diagnostic assessments are used to identify placement for intervention or special programs for struggling students in need of specialized targeted instruction (Fisher & Frey, 2008). These are administered as needed, often at the beginning of the year, for proper student placement.

Instructional assessments to evaluate students reading skills can be formal or informal. According to Meisels and Piker, (2001) instructional assessments are used to obtain information about children's classroom performance in order to guide instructional decision-making and provide instructionally relevant information to teachers. Moreover, they are used to clarify what students are learning and have begun to master by providing information that is relevant to understanding individual students' learning profiles. In short, the purpose of assessment is to enhance learning and improve instruction.

The increased emphasis on accountability in the past decade has led to a growing knowledge base surrounding assessment purposes in literacy learning. Lapp, Fisher, Flood, and Cabello (2001) categorize the purposes of assessment as follows: (1) diagnosis of individual student needs, (2) provision of accountability information, (3) evaluation of programs, and (4) informing literacy instruction. Assessment of literacy skills and practices is not a recent phenomenon. The literature on teachers' instructional decision making reveals that teachers continually use formal and informal assessment information to diagnose individual student needs and to inform instruction. Moreover, "of all the testing that take place in schools, the vast majority is created by teachers or is otherwise some form of informal classroom or instructional assessment mean to diagnose particular strengths and weaknesses in individual student performances and monitor student progress" (Meisels & Piker, 2001, p. 6).

Furthermore, the literature also reveals that teachers prefer these types of assessments over large-scale assessments, and often characterize large-scale assessment data as untimely, lagging indicators of student performance (Guskey, 2007). In a study investigating elementary teachers' views of the most effective reading assessments used to gather data

about student reading performance and guide further instruction, Campbell (2001) concluded that teachers perceived all reading assessments as having some degree of merit and that more formative assessments involving concepts about print, phonemic awareness, and phonics were found to be highly effective in determining reading proficiency and in assisting teachers to plan for instruction and making judgments about student performance in literacy.

READING ASSESSMENTS

Because no single assessment can cover all of the areas of literacy, teachers use a variety of instructional assessments to evaluate students' reading skills. Several approaches to assessing literacy performance focus on the following areas of literacy learning:

Phonemic Awareness and Phonics

A great deal of evidence from reading research suggests that phonics instruction and phonemic awareness instruction are foundational to reading achievement (Beck & Juel, 1999; Stanovich, 1986). Phonemic awareness involves having students identify printed words and manipulate phonemes in spoken syllables and words. Phonics involves students acquiring letter-sound correspondences and spelling patterns, while applying this knowledge to their reading.

Research from the past decade demonstrates that phonemic awareness instruction has profound effects on reading achievement. Correlational studies have identified phonemic awareness and letter knowledge as the two best school-entry predictors of how well children will learn to read during the first two years of instruction (National Reading Panel, 2000). *“Early attainment of decoding skills are important because this early skill predicts later skill in reading comprehension. There is strong and persuasive evidence that children who get off to a slow start rarely become strong readers” (Beck & Juel, 1999), p. 2).*

Measuring phonemic awareness can be grouped into three broad categories: sound comparison, phoneme segmentation, and phoneme blending. Sound comparison tasks involve students using a number of different formats to make comparisons between the sounds in different words. Phoneme segmentation tasks involve students counting, pronouncing, deleting, adding, or reversing individual phonemes in words. Phoneme skill blending involves students listening to a series of phonemes in isolation and blending the sounds together to form a word (Torgesen, 1999).

Measuring knowledge of phonics or letter name knowledge involves presenting students with letters in simple uppercase and asking students for its name. Similarly, measuring letter-sound knowledge involves presenting all letters in lower-case type and asking for the sound of each letter (Torgesen, 1999). Common valid and reliable measures used to assess phonics and phonemic awareness include the Yopp-Singer Test of Phoneme Segmentation (Yopp, 1995), Dynamic Indicators of Early Literacy, DIBELS (Kaminski & Good, 2009), and the Test of Phonological Awareness-Kindergarten (Torgesen & Bryant, 1994).

Comprehension

According to the National Reading Panel (2000), reading comprehension is a complex cognitive process that cannot be understood without a clear description of the role that vocabulary development and vocabulary instruction play in the understanding of what has been read. Moreover, comprehension is an active process that requires an intentional and thoughtful interaction between the reader and the text.

Measures of reading comprehension commonly involve students' ability to answer open-ended, multiple choice, or true-false questions following reading, or involve students in recalling or retelling the content of a passage just read (Lipson & Wixson, 2008). Furthermore, assessing reading often involves the use of a reading inventory, miscue analysis, a running record to identify student's reading skills, behaviors, abilities, strategies, and comprehension. A running record is a tool for recording a child's exact reading responses, coding the responses, and analyzing the reading behaviors a child makes (Fountas & Pinnell, 1996). Such measurements assist teachers in identifying instructional and independent reading materials that students can read, with and without teacher assistance.

Vocabulary

Vocabulary knowledge has long been recognized as an essential component in the development of reading skills. Researchers have found that vocabulary knowledge affects long-term student achievement and that vocabulary growth cumulates over time (Stahl & Nagy, 2005). Allen (1999) suggests that vocabulary instruction makes a difference in reading performance and that explicit vocabulary instruction influences students' reading comprehension. Furthermore, Hart & Risley's (1995) seminal study on vocabulary

concluded that there were profound differences in vocabulary knowledge among learners from different socioeconomic groups from toddlers to high school

Vocabulary involves student's oral vocabulary, reading vocabulary, receptive vocabulary, and productive vocabulary. Oral vocabulary refers to words that are used or recognized in speaking or listening. Reading vocabulary refers to words used or recognized in print. Receptive vocabulary is the vocabulary that one can understand when it is presented in text or as one listens to others speak, while productive vocabulary is that vocabulary used in writing or when speaking to others. In schools, the types of vocabulary assessments used include standardized tests or informal tests generated by the classroom teacher. For example, measuring vocabulary can involve having the student select a definition for a word from a list of alternatives or selecting a word for the definition or having the student generate a definition for the word.

Fluency

According to Rasinski (2003), reading fluency is essential to reading quickly, effortlessly, and efficiently with meaningful expression. This speed and accuracy in reading is among one of the most critical factors necessary for reading comprehension, as readers are able to spend their cognitive energy on meaning making and not on decoding words. Measures of students' oral fluency involve a one-minute timed sampling of a students' oral reading from at least two grade level passages. From these timed samplings, students' oral reading fluency or "correct words per minute" are analyzed against oral reading fluency norms (Hasbrouck & Tindal, 1999).

Spelling

Over the years, many scholars (Ehri, 1980; Gill, 1989; Juel, Griffith, & Gough, 1986; Zutell & Rasinski, 1989) have revealed that children's spellings provide strong support for students reading and writing development. Gentry (1997) maintains that, "reading is tied to spelling by the way kids store knowledge about words in memory" (p. 3).

Popular spelling assessments include dictated word inventories administered whole group or individually, such as Ganske's (2000) Developmental Spelling Analysis, or looking closely at students' error patterns such as Sipe's (2003) analysis of students' written spelling inventories, that require students to think and write about how they learned to spell or weekly

spelling tests derived from state board approved basal reading programs. The purpose of these assessment is to gather information about students' stage of spelling development and to identify specific strengths and weaknesses in their featural knowledge.

Classroom teachers have a rich source of assessment data in literacy. Informal reading inventories, running records, sight word tests, and measures of silent reading ability have a long history in the types of literacy assessment classroom teachers use to inform literacy instruction (Frey & Hiebert, 2003). More recently, a variety of informal assessment measures such as performance samples, conferences, questioning, observations, rubrics or checklists, portfolios, inventories, surveys, and interviews have also served as data sources. Classroom teachers often trust the results from these assessments because they are immediate, relevant, and relate directly to instructional goals in the classroom (Guskey, 2007). Such sources of literacy assessments were developed primarily to measure and monitor student performance and growth across a variety of areas in literacy development, particularly in concepts about print, letter recognition phonemic awareness, phonics, vocabulary, fluency, and reading comprehension. Moreover, many of these literacy assessments are administered more than once in a school year or across school years.

Despite the many uses of assessments in reading, researchers in the field argue that effective reading assessments should (Afflerbach, 2004, pp. 12-15):

- Include both formative and summative information
- Measure a wide range of skills with a variety of formats and responses
- Provide clear distinctions between the acquisition of reading skills and the effective uses of the skills for various purposes, assessments
- Provide students with useful information about their developmental accomplishments with clear suggestions for improvement
- Provide teachers with useful diagnostic information that can be linked to classroom instruction
- Provide administrators with data related to specific criteria and standards of performance in order to assess annual progress
- Be aligned with classroom curricula and instruction

TEACHERS' KNOWLEDGE OF LITERACY

Given the range of literature on the types of literacy assessments available to classroom teachers, it is important to note that the literature on teachers' instructional

decision making concludes that conceptions of subject matter highly influence teachers' instructional decision making (Shavelson, 1983; Shavelson & Stern, 1981). Frey and Heibert (2003) would agree that when it comes to literacy, "the basis of teacher assessment is necessarily linked to the teacher's vision of literacy" (p. 609). Therefore, teachers' knowledge and beliefs about literacy play a significant role in the types of assessment information teachers use and what they do with the assessment information. More importantly, teachers' knowledge and beliefs about literacy has implications for providing effective or ineffective reading instruction and for diagnosing student reading abilities.

Aligning teachers' subject knowledge about literacy with assessment information becomes an ongoing professional development experience. According to Fitzharris, Jones, and Crawford, (2008), teachers need to internalize and be able to put into practice a number of specific understandings. Among these are the basics of describing the reading cueing systems that readers use, successfully completing and analyzing running records, and using the miscue analysis of those records to guide instruction. In their qualitative study of six teachers at an elementary school in South Carolina who received training and support in literacy and running records assessments, the researchers found that teachers possess varying stages of development in literacy knowledge despite receiving the same support at the school. Educational background, years and level of teaching experience, involvement with special education, and previous professional development in literacy were among the factors influencing teachers' literacy knowledge. The results revealed that teachers with the highest earned degrees, previous literacy staff development support, and greatest responsibility for teaching children how to read (first grade teachers) possessed the greatest knowledge of the reading cueing systems and the most accuracy in the miscue analysis of running records.

Other studies have explored how teachers' understandings of early literacy influence how they identify students as struggling readers. For example, in Baily and Drummond's (2006) qualitative study of K-1 grade teachers from five schools in Southern California, they found that teachers have a wide array of initial concerns for students, and that when teachers are asked to reflect on performance, most teachers were able to articulate a wide range of difficulties facing their low-achieving students. Results revealed 28 different rationales as to why a student was identified as at risk for literacy difficulties. The rationales focused on commonly targeted areas (e.g. phonics, phonemic awareness) clustered into four broad areas:

reading, writing, oral language, and behavioral or social considerations. Although the most frequent reasons that a student was identified as at-risk for literacy difficulties were trouble blending sounds into words, trouble learning letter names, difficulty learning letter sounds, lack of oral fluency, and concentration/attention issues, the findings suggest some discordance between teachers' specific reasons for concerns and their understanding of early literacy. Baily and Drummond's (2006) study has implications for teacher professional development focusing on broadening teachers' repertoire of assessment practices to encompass a variety of early literacy skills to improve intervention and teacher decision-making.

In a study by Hayes and Robnolt (2007) that examined a two-year literacy data-driven professional development model that involved elementary teachers in a small mid-Atlantic coast city, results revealed the need for an increase in teacher subject matter of literacy in the areas of word knowledge for kindergarten and first grade and fluency and reading comprehension for second through fourth grade. This study suggests that while using literacy assessment data are important, the use of school-wide achievement data can also assist school leaders in designing relevant and effective professional development for classroom teachers.

With regard to decision making in literacy, questions need to be asked about what types of information teachers use, what types of decisions are made, and in what ways do teachers' knowledge of literacy influence teacher decision-making. Such answers would have implications for districts and schools seeking ways to better inform instruction in order to better serve students at every level.

TEACHERS' KNOWLEDGE OF ASSESSMENT

Earlier, it was pointed out that Stiggins (2002) contends that it is essential for schools to build an assessment-literate faculty and to focus on effective data analysis. Moreover, Stiggins (2002) estimates that teachers spend up to 50% of their instructional time in assessment-related activities. Studies on "assessment literacy" or teachers' knowledge or competency in assessment found that teachers feel inadequately trained in the area of assessment, resulting in teachers not knowing how to use assessment effectively. Moreover, the National Council on Measurement in Education in conjunction with the National Education Association and the American Federation of Teachers defined essential standards

that serve as essential factors related to assessment literacy. The standards address seven broad areas in educational assessment (National Council on Measurement in Education, 1995, p. 10) and were identified as the Standards for Teacher Competence in Educational Assessment of Students:

1. Choosing assessment methods appropriate for instructional design
2. Developing assessment methods appropriate for instructional decisions.
3. Administering, scoring, and interpreting the results of both externally produced and teacher-produced assessment methods
4. Using assessment results when making decisions about individual students, planning teaching, developing curriculum, and improving schools
5. Developing valid pupil grading procedures
6. Communicating assessment results to students, parents, other stakeholders
7. Recognizing unethical, illegal and other inappropriate methods and uses of assessment information.

Plake, Impara, and Fager's (1993) study that measured teachers' competency levels on each of the standards identified in the Standards for Teacher Competence in Educational Assessment of Students found that teachers performed best in the areas of administering, scoring and interpreting results and poorest in the area of communicating test results. Other study results suggested that teachers who had some measurement training scored significantly higher than those with less training.

INSTRUCTIONAL DECISION MAKING

The literature on teachers' decision making traces back to the 1920's with one of the first attempts to investigate the accuracy of teacher's judgmental processes examined by Varner. In his classic study investigating the accuracy of teachers' ratings of students' intelligence, Varner concluded that teacher's judgments of students' intelligence were indeed accurate. 50 years later, present-day models of teachers' judgments and cognitive decisions have contributed to our understanding and analysis of teachers' decision making (Varner, 1923).

While the research on teachers' cognitive behavior is extensive, three purposes have been addressed by researchers regarding teacher judgment (Shavelson, 1983, .p. 395-401):

1. To describe the judgment process, including factors taken into account by the teacher and the relative weights given to these factors in reaching a judgment

2. To investigate the accuracy of teacher judgments, particularly teacher predictions of student achievement and attitudes
3. To explore methodological questions dealing with matters such as how teachers use information of varying reliability and how varying the amount of information available affects the judgment process or judgmental accuracy

Scholars in the field have focused on how the teacher acts or performs in the classroom. Such studies of teacher's human cognitive behavior in the classroom have dominated the field of teacher decision making. Clark and Yinger's (1977) work concluded that teachers' cognitive information processing is concerned with teacher judgment, decision making, and planning, and that the study of the thinking processes of teachers—how teachers gather, organize, and interpret, and evaluate information can enhance our understanding of teacher behavior. Their work characterizes teacher judgment as one of the most important cognitive processes in the mental life of teachers. Shulman and Elstein's (1975) work sought to represent teachers' preactive and interactive thought processes during planning and during teacher interaction with students in the classroom. From their work, they have characterized teachers as problem solvers, information processors, and decision makers.

Teachers as Problem Solvers

Joyce and Harootunian's (1964) studies investigating the problem solving behavior of teachers during preactive planning suggest that teachers possess the ability to develop and organize learning objectives and teaching procedures using a variety of data sources such as knowledge of learners and knowledge of subject matter. Additionally, teachers possess the ability to develop evaluative procedures to determine teaching effectiveness and its impact on student achievement.

Teachers as Information Processors

Ryans (1963) developed a theory of teacher behavior that suggested that the teacher functions as an information processing system, who is sensitive and responsive to prevailing conditions in the classroom and who is able to retrieve and use stored or internal knowledge, intuitions, and affective data to improve student achievement. Ryans defined information processing by teachers as the selection, preparation for transmission or delivery of instruction, and forwarding of some meaningful information or message to students to aid them in the acquisition of an appropriate student outcome, objective, or behavior. Ryans

(1963) conceptualization of the teacher during classroom instruction characterized teacher's activities as a five-phase sequence consisting of teachers (p. 278):

1. Sensing, identifying, and classifying internal and environmental information inputs
2. Evaluating possible courses of action in light of circumstances
3. Decision making, involving the selection of appropriate information and means of delivery to students
4. Programming (ordering and arranging) of the teacher behavior
5. Transmission of appropriate information

Teachers as Decision Makers

The works of Shavelson and Stern (1981) and Shulman and Elstein (1975) have characterized decision making as being pervasive in teaching. Decisions are involved in almost every aspect of a teacher's professional life, especially in planning, implementing, and evaluating instruction. Their work has advanced the position that teachers' decision making is of significance, revealing that teachers' decision making are reasonable or rational and intended to optimize student outcomes or achievement (Shavelson, 1976). Results from their studies have concluded that teachers are seen as active agents or intuitive statisticians with the ability to use many instructional techniques or strategies at their disposal to form judgments about students' cognitive, affective, and behavioral states to improve student achievement (Shavelson, 1976; Shavelson et al., 1977; Shavelson & Stern, 1981; Shulman & Elstein, 1975).

According to Shavelson (1983), "Teachers are seen as active agents with many instructional techniques at their disposal to help students reach some goal. In order to choose from this repertoire, teachers must integrate a large amount of information about students from a variety of sources. Teachers must somehow relate this information to their own beliefs and goals, the nature of the instructional task, the constraints of the situation, and so on, in order to reach a judgment" (p. 397).

The literature on teachers' instructional decision making reveals that teachers continually use formal and informal assessment information to diagnose individual student needs and inform instruction. Classroom teachers have a rich source of assessment data in literacy. Informal reading inventories, running records, sight word or high frequency word tests, and measures of silent reading ability have a long history as the types of literacy

assessment classroom teachers use to inform literacy instruction (Frey & Hiebert, 2003). More recently, a variety of informal assessment measures such as performance samples, conferences, questioning, observations, checklists, portfolios, inventories, surveys, and interviews have also served as data sources.

A handful of studies suggest that teacher judgment plays an important part in predicting student cognitive and affective achievement. Much of the research on teacher judgment or instructional decision making recognizes the complexities of teacher decision making: the task of simultaneously processing a large amount of information, the influence of *heuristics*, the implicit rules that people are unaware of and use in complex tasks in order to select information, and *attributions*, teachers' estimates of student ability because they deal with the processes by which people integrate information to arrive at causal explanations for events (Borko & Shavelson, 1978; Shavelson & Stern, 1981).

Much of the research on instructional decision making includes a variety of approaches that explore how thoughts get carried into actions. Such methods attempt to collect data on mental processes and attempt to probe teachers' thoughts and judgments. These methods include policy capturing, lens modeling, process tracing, stimulated recall, case study, and ethnography as shown in Table 2.

Perhaps the strongest influences on teachers' instructional decision making include information from a variety of sources about student's abilities or academic achievement, class participation, self-concepts, social competence, classroom behavior, work habits, independence, as well as teachers' conceptions of a subject matter (Shavelson, 1983; Shavelson & Stern, 1981).

Shavelson et al. (1977), have found that teachers primarily use information about student achievement and problematic behavior in judging student ability. In judging motivation, teachers rely heavily on information about achievement, problematic behavior, and work habits, and that estimates of behavior problems rely on information about classroom behavior and achievement. Decisions about selecting content, tutoring or handling behavior problems, and grouping students tend to be made on the basis of teachers' judgments about students.

Table 2. Methods of Investigating the Decision Making Process of Teachers

Approach	Methodology		
	Instruments & Procedures	Analysis	Limitations
Policy Capturing	<p>Descriptions of a number of hypothetical students with a variety of variables such as student achievement, gender, class participation, ability to work independently, and classroom behavior.</p> <p>Teachers are asked to judge each student's chance of earning a B average or better at the end of the year.</p>	Judgments would be predicted from the five variables. The prediction equation would be interpreted as a model of the teacher's policy for judging students' probable success.	Although the most widely used method in studying teachers' decision making, issues with generalizability as a result of a laboratory setting with hypothetical judgmental tasks.
Lens Modeling	<p>Three types of information are required: (a) a criterion measure of the event being judged (e.g., students' preferences for reading materials); (b) a list of cues predictive of the criterion measure (e.g., presence and absence of fantasy, animals, danger and humor); (c) teachers' judgments of students' preferences (i.e., predictions of each student's reading preference).</p>	A regression of teachers' judgments provides a model of the teachers' policies reaching their judgments. The correlation between teachers' predictions of students' reading preference and students' actual preferences provides a measure of overall judgmental accuracy.	Issues with generalizability as a result of the laboratory setting with hypothetical judgmental tasks.
Process Tracing	Participants are asked to "think aloud" while performing a task, solving a problem or reaching a decision.	The verbal protocol then becomes the data to analyze. Content analysis (e.g., the number of references to behavioral objectives is counted) or a	

(table continues)

Table 2. (continued)

Approach	Methodology		
	Instruments & Procedures	Analysis	Limitations
		flow chart modeling the teacher's thought processes.	
Stimulated Recall	When process tracing interferes with task performance, a teacher's lesson is either audio- or videotaped and later played back to the teacher, who attempts to recall the covert mental activities that accompanied the overt behavior.	Same as Process Tracing	
Case Study and Ethnography	A narrative account of an object of social inquiry such as a classroom, a school system, in its cultural context.	Descriptive	

Source: Shavelson, R. (1983). Review of research on teachers' pedagogical judgments, plans, and decisions. *The Elementary School Journal*, 83(4), 392-413.

Note: See specifically pgs. 393-395.

Additionally, Ingram et al.'s (2004) longitudinal study of nine high schools nominated as leading practioners of instructional decision making revealed that the types of data that teachers use to make decisions include both systematic and non-systematic data such as anecdotal information, experience, or intuition. Furthermore, this study also identified several barriers influencing teacher decision-making: mistrust of the type of data, measurement challenges with the types of information teachers want and need to know, lack of time to collect and analyze data with a majority of the time being spent on collecting the data, and teacher efficacy with data results. However, when the barriers to successful data use are minimized, teachers can make informed decisions about student learning and classroom instruction.

Studies have shown that teachers often rely on their own assessments as the primary source of information on student achievement, and that these assessments provide information relevant to the decisions they face (Stiggins et al., 1986). The need for linking standards, assessment, and classroom instruction to improved teaching and learning is just

beginning in schools. One example of a collaborative data culture occurred at a middle school in New Mexico where teachers focused on examining student work and using the data to inform their instruction. Participants in the study were middle school classroom teachers who, over a two-year period, collaboratively wrote and administered eight common assessments across the content areas and met to analyze and discuss the results of the assessments. The process included: (1) developing pacing guides to allow teachers to ensure that standards were taught throughout the year and that instructional materials aligned with those standards, (2) developing common assessments to be administered to students as a means for monitoring student progress; (3) teaching and assessing following a backwards planning model, (4) collaboratively scoring the common assessments, and (5) revising and re-teaching based on student assessment data. This study suggests that teachers should engage in purposeful dialogue around student data and instruction and that this type of collaborative inquiry can lead to increased student achievement and increased data literacy for teachers (Fisher, 2005, p. 10).

Another study by Parker, Fawson, Ludlow, Reutzel, Sudweeks, and Smith (2006) examined a widely used reading assessment, running records, with teachers scoring reliability. The study involved 10 first grade teachers who taught in a large suburban school district in the western United States who were asked to assign first grade students to one of three proficiency groups. The criteria included: (1) teacher observation, (2) student performance on classroom assignments, and (3) end of level reading test scores. Using these criteria, four students were identified as above-average readers, four students as average, and four students as below-benchmark readers. Students were required to read two grade-level narrative passages at Reading Recovery Level 14. One text was a reading recovery text and the other a Developmental Reading Assessment test. Results from the study indicated that 10 first grade teachers or raters could reliably detect differences in the reading abilities of individual students, regardless of which passage the student read or which rater rated the passage. Results from the study suggest that teachers must ensure that assessment scores are accurate and a reliable estimate of students' knowledge in order to use the assessment as a standardized measure.

SUMMARY

With regard to decision making in literacy, questions need to be asked about what types of information teachers use, what types of decisions are made, and in what ways do teachers' knowledge of literacy influence teacher decision making. Further research is needed to understand the thought processes of teachers as they evaluate student achievement or performance. Therefore, this study will contribute to the field of teacher decision making in literacy by investigating how teachers use data for instructional purposes. Moreover, doctoral studies on elementary teachers' data-driven instructional decision making in urban settings is limited. Therefore, this study will add to the research by attempting to explore these unanswered questions. Such answers would have implications for districts and schools seeking ways to better inform instruction to better serve students at every level.

CHAPTER 3

OVERVIEW

This chapter will discuss the methodology used to conduct the study. The purposes of this study were to discover the ways in which teachers at the elementary level used multiple types of literacy data, and to investigate the types of decisions teachers made with the data to accelerate student achievement in literacy.

The design is phenomenology with interviews that followed a process tracing approach and videotaped data team meetings to reveal teachers' experiences with data-driven instructional decision making or their decision-making models used when analyzing literacy data. Data sources for this study included multiple measures including a web-based group administered survey, stratified random sampling for structured interviewing, and videotaping of grade level data analysis team meetings. Appendix A highlights the recruitment materials for this study. Twenty-seven general education classroom teachers, from a single school site, participated in the web-based survey (see Appendices B and C). Of the 27 teachers, stratified random sampling was utilized to select six classroom teachers, representative of both primary and upper grade, who participated in structured interviewing. During structured interviews, teachers were presented with fictitious student case reports containing multiple literacy assessment information for a group of students and individual students. With the case reports, participants were asked to analyze the data through the use of the "think aloud" method that requires participants to verbalize their thought processes when engaging in a task (Somerén, Barnard, & Sandberg, 1994). Research on the "think aloud" method suggests no more than three to five participants for the collection of think aloud data (Chi, 1997).

Stratified random sampling is a popular sampling method in qualitative research and is used to carefully select participants with similar characteristics as opposed to random selection (Miles & Huberman, 1994; Patton, 1990). Participants were stratified by grade level and then randomly selected for interviewing. This resulted in the random selection of two teachers from grade one, two teachers from grade three, and two teachers from grade five. These six teachers participated in the interviews. Both qualitative and quantitative

analysis were used to provide a rich, in-depth description of the experiences of the teachers. The findings may implications for districts and schools using student assessment information to inform instruction in order to better serve students at every level.

RESEARCH QUESTIONS

Four main research questions guided this study:

1. In what ways do teachers' experience, knowledge of literacy and beliefs about literacy instruction influence teacher decision-making?
2. How do teachers make data-driven instructional decisions in literacy?
 - a. What literacy assessment information do teachers find useful and use more often?
 - b. How do teachers determine interventions for individual and groups of students based on data?
 - c. What kinds of interventions do teachers identify?
3. What data-driven decision-making differences exist between primary (K-2) and upper grade (3-5) teachers?
4. What decision-making models do teachers use when making data-driven instructional decisions in literacy?

RESEARCH DESIGN AND METHODS

Reading research often employs the use of mixed methods in collecting data for research studies (Kamil, 2005). In cases where researchers want to investigate the association between students' reading level and student achievement on standardized testing or whether the teaching of predicting, questioning, and summarizing make a difference on individual student's reading comprehension, the collection of quantitative data, where the data are in the form of numbers and statistics, collected through surveys and questionnaires provides valuable information. Certainly, the use of quantitative designs is useful in reading research. However, for a more in-depth understanding of an experience that requires the use of naturalistic settings and participant observations, such as how do teachers teach predicting, questioning and summarizing to students, qualitative research designs are just as valuable. When deciding on which design to use, Shavelson and Towne (2002) argue that research methodologies should be guided by the actual research questions. Moreover, Kamil (2005) maintains that quantitative research can answer some questions and not others, and that there are times when it is crucial to use observational methods.

Since this study's design was to describe the experiences of teachers' data-driven instructional decisions in literacy, phenomenology with mixed methods were best suited to collect rich data for both description of the experiences and triangulation. Phenomenology is most concerned with the human experience. Phenomenological research-based designs describe the experiences of a situation or phenomenon to reveal the essence of an experience. Creswell (1998) states, "a phenomenological study describes the meaning of the lived experiences for several individuals about a concept or the phenomenon" (p. 51).

Furthermore, the literature on exploring teachers' thought processes advocate for research designs that focus on obtaining verbalized data or mental models in naturalistic settings using observational data that require participants to capture what the subject is actually doing (Somerén et al., 1994; Young, 2005).

Using this design, a combination of three approaches was used for data collection. Teachers were surveyed, interviewed, and videotaped. All three approaches provided a rich, in-depth experiential account of the ways in which teachers make use of data for literacy related instructional decision making use in schools. A process tracing approach was the main method for collecting data. The approach was used during the interviews. Using this approach, teachers were presented with fictitious student case reports containing multiple literacy assessment information for a group of students and for an individual student, and then asked to "think aloud." These "think alouds" or verbal reports of evaluating student performance and reaching a decision related to instruction and intervention were analyzed.

A PROCESS TRACING APPROACH

A process tracing approach (see Chapter 3, Definitions) where participants are required to "think aloud" when reviewing literacy assessment data was used as the primary method to discover how teachers make data-driven instructional decisions in literacy. While this approach is not traditionally used in measurement or assessment research, scholars in this field suggest that this type of approach would uncover the answers to teachers' data-driven decision making (Stiggins et al., 1986). Similarly, process tracing approaches attempt to describe the intellectual processes used by subjects as they render judgments and make decisions or solve problems (Shulman & Elstein, 1975).

THINK-ALOUD METHOD

Ericsson and Simon's (1993) work on verbal think-aloud methods have given new opportunities for exploring teachers' thought processes. Their work suggests that asking participants to talk aloud or think aloud is the ideal method for studying complex actions or behaviors, and that participants have the potential to complete a task while capturing what is held in the short-term memory. Moreover, Crutcher (1994) states that, "Verbal reports can provide information difficult to obtain by other means" (p. 242). Similarly, Payne (1994) contends that the think-aloud method is appropriate to tasks that involve cognitive processes that take more than a few seconds to perform and when tasks involve verbal types of information.

Capturing think aloud data requires the participants to continually verbalize the thoughts in their head as they engage in an activity, solve a problem, or make a decision. The input from the researcher during this process is generally limited to prompts such as "keep talking." The goal of the think-aloud method is to capture, via audio recording, what the participant is actually doing through what he/she says and does so that the data can be a source of insight into the thought processes of the participants (Young, 2005).

According to Chi (1997), "Verbal analysis is a methodology for quantifying the subjective or qualitative coding of the *contents* of verbal utterances. In verbal analysis, one tabulates, counts and draws relations between the occurrences of different kinds of utterances to reduce the subjectiveness of qualitative coding" (p. 273). Given the complexity of the think-aloud method, at the start of the first interview participants were asked to engage in a "mock interview" using mock case reports. The purpose of the mock interview was to simulate the process tracing approach and to practice the think-aloud method (see Appendices D and E).

The fictitious case reports were designed by the researcher and intended to describe a group of students and individual students, as well as to correspond with a specific grade level. The case reports included literacy assessments that were familiar in scope and had previously been administered by the participants. There were a total of seven fictitious student case reports and two mock case reports (see Figure 4). Each case report included student demographic information, language fluency information, and student performance data from state standardized assessments, district assessments and site assessments

Figure 4. Case reports for interviews.

measuring the following skills: phonics, phonemic awareness, reading comprehension, fluency, and spelling (see Appendices F-L for the full case reports).

Three criteria were used for selecting the type of literacy assessment data to be included on the reports. First, the researcher included literacy data that was familiar and currently used by the classroom teachers such as the California standards English language

arts standardized assessment data, the California English Language Development Test (CELDT) data, District Literacy Benchmark data, Houghton Mifflin Summative data, reading fluency (Correct Words Per Minute) data, class reading level (Fountas and Pinnell instructional reading level) data, and running records. Second, the researcher focused on measures whose primary purpose was instruction in literacy not accountability. Finally, the researcher included measures that targeted students between kindergarten and fifth grade. During each interview session, participants were asked to select one case report to respond to based on their grade level experiences.

INSTRUMENTS

To maximize internal and external validity, the need for triangulation is essential in order to accurately measure and interpret the data. Pioneers in the field of qualitative study (Creswell, 1998; Stake, 1995) would argue that the ideal research design would include extensive forms of data collection such as field observations at the school, field notes, physical artifacts, and structured teacher interviews, along with teacher surveys as a means of triangulation to further explore the factors associated with teachers' data driven instructional decisions. Several data collection instruments were used for this phenomenological study to provide a rich, in-depth description of this study (see Figure 5).

The researcher integrated quantitative and qualitative data sources to answer each research question. The use of quantitative data sources helped confirm or disconfirm the qualitative data sources and vice versa. For example, the researcher used interview data to assist in the confirmation or disconfirmation of the categorization and Likert scale results of the survey data. That is, participants with various background and experiences in assessment and literacy were asked to categorize types of literacy assessments most important to them and to identify methods used to analyze data for a group of students and individual students, along with selecting the best possible answer for questions relating to choosing, developing, administering, analyzing, and interpreting literacy assessments for literacy-related instruction and interventions. The data were triangulated to see if those with more experiences and knowledge in assessment and literacy frequently used more types of methods to analyze literacy assessment data for instruction and intervention.

Figure 5. Data sources for triangulation.

DATA COLLECTION SOURCES

Quantitative and qualitative data sources were used for this study.

Quantitative Data Sources

Quantitative data were collected through the use of a survey collecting information on:

- Participants' background and experiences
- Types of student assessments administered in literacy
- Types of student literacy assessments analyzed
- Types of decisions made about struggling readers
- Whether changes in teachers' instructional practice occur as a result of literacy assessment results and subsequent data analysis

All 27 elementary teachers at the school site completed a web-based 5-part survey created by the researcher and adapted from Plake et al.'s (1993) survey instrument. The researcher used SurveyMonkey as the web-based system for collecting the survey data (see Appendix C). The survey was organized into five parts. Parts 1 and 2 included close-ended

questions containing categorical questions, and Likert scale questions using a matrix design of the types of assessments administered and methods of data analysis. Part 3 included yes or no questions related to whether changes had been made in instructional practice as a result of assessment data and data analysis. Part 4 included both multiple-choice and open-ended questions adapted from Plake et al.'s (1993) instrument, and included a scoring key. The questions were related to how teachers choose, develop and administer assessment methods, as well as how teachers analyze and interpret assessment results. Part 5 included two student scenarios describing typical struggling readers, with an open-ended question asking teachers for literacy-related instructional recommendations for the struggling readers. The student scenarios were adapted from Moore's (2004) instrument that collected data on how teachers' diagnose students' reading strengths and needs and plan for differentiated instruction. The survey was administered to all 27 teachers in the building during a teacher preparation day in August 2010, in the school's computer's lab. It took 15-20 minutes to complete the survey.

Qualitative Data Sources

Qualitative data sources included structured interviews and videotaping.

STRUCTURED INTERVIEWS

Interviewing is one of the most common and powerful ways of gathering data in qualitative research. Interviewing includes a wide variety of forms and a multiplicity of uses. As a result, both qualitative and quantitative researchers tend to rely on the interview as the basic method of data gathering (Fontana & Frey, 2005). This study included a total of 18 separate structured face-to-face verbal interchanges between each of the six participants, on three separate occasions, and the researcher. The process tracing approach was used during each interview. A description of each interview session will be further described in the procedures section of this chapter.

The purpose of the interviews was to obtain a rich, in-depth experiential account of individual teachers use of data in schools. For this study, the researcher selected participants using a stratified random sampling from the 27 teachers at the school site.

A total of six teachers, two teachers from grade 1, two teachers from grade 3, and two teachers from grade 5, were selected to participate in the interviews.

The researcher used an Interview Protocol designed from the literature on the think-aloud method and asked each participant the same series of preestablished directions and questions in the same sequence (see Appendix E). Due to the nature of capturing think-aloud data that requires participants to continually speak aloud the thoughts in their head as they work, input from the researcher was limited to prompts such as “keep talking” or “what are you thinking” (Young, 2005).

The interviews were digitally recorded and transcribed verbatim by a professional transcriber. The transcriptions were then imported into a Microsoft excel spreadsheet. The researcher then coded the responses and identified similar categories of responses or patterns of behavior that emerged as teachers analyzed the case reports into a Microsoft excel spreadsheet. The researcher then identified broad areas as significant themes. Participants then participated in “member checking” where they examined rough drafts of the interview responses for accuracy. The interviews were conducted after school at the school site and were restricted to 40 minutes each.

VIDEOTAPING

Since participants for this study were currently involved in weekly grade level Professional Learning Communities where they meet one day a week for one hour, interview participants were videotaped by the researcher on one occasion with their grade level during a data analysis meeting. The videotaping took place in the fall and coincided with the release of the 2009-2010 California standards testing data. Videotapings were transcribed verbatim by a professional transcriber. The transcriptions were then imported into a Microsoft excel spreadsheet. The researcher then coded the responses and identified similar categories of responses or patterns of behavior that emerged as teachers analyzed the case reports. The researcher then identified broad areas as significant themes.

DESCRIPTION OF THE CONTEXT

Participants for the study included teachers and the researcher.

Teachers

Participants for this study included 27 elementary teachers from grades kindergarten through fifth grade. Of the 27 teachers, 4 teachers taught kindergarten, 5 teachers taught first

grade, 7 teachers taught second grade, 5 teachers taught third grade, 2 teachers taught fourth grade, and 4 teachers taught fifth grade. All 27 teachers were fully credentialed, have met NCLB teacher quality requirements, and possessed the Cross-Cultural Language Academic Development (CLAD) or Bilingual Cross-Cultural Language Academic Development (B-CLAD) certification. Of the 27 teachers, 4 teachers had fewer than five years of teaching experience, 15 had six to ten years experience, 1 had eleven to fifteen years of experience, and 7 had more than fifteen years of experience (see Table 3). Of the 27 teachers, 13 had a Bachelor's degree and 14 had a Master's degree. All 27 teachers participated in the web-based survey.

Table 3. School Staff Summary, 2009-2010

School Summary	Total
Certificated Classroom Staff	27
Fewer than 5 Years of Teaching Experience	4
6-10 Years of Teaching Experience	15
11-15 years of Teaching Experience	1
More than 15 Years of Teaching Experience	7

All Participants for this study were currently involved in Professional Learning Communities and received weekly substitute release time, providing an opportunity to meet regularly as grade level during the school day for the duration of one hour to analyze student assessment data to inform their teaching and instruction.

The Professional Learning Communities (PLC) include teams of teachers working together and collaborating on shared achievement goals focused on learning, data and results. Four critical questions drive the work and purpose of Professional Learning Communities (DuFour et al., 2006):

1. What do students need to know and be able to do?
2. How will we know when they have learned it?
3. What will we do when they haven't learned it?
4. What will we do when they already know it?

Participants at the site have received Power Standards training to identify essential grade-specific standards from the list of state academic content standards as well as training

in a set of guidelines or rules for how to look at assessment data. The Power Standards are essential standards fundamental for students to be successful and include lifelong endurance, leverage across multiple disciplines, and readiness for the next level of learning (Ainsworth & Viegut, 2006). As a result, they had a shared knowledge about what students need to know and be able to do and have prioritized the yearlong curriculum to teach these essential standards. In PLCs, teachers have developed and used common formative assessments as pre-and-post assessments to identify those who already know the essential standards and to monitor student progress. The use of data allowed teachers to systemically respond to students who need support.

TEACHERS PARTICIPATING IN STRUCTURED INTERVIEWS

Stratified random sampling was used to identify six classroom teachers for the interviews. Stratified random sampling is a popular technique in qualitative research and is used to carefully select participants with similar characteristics as opposed to random selection (Miles & Huberman, 1994; Patton, 1990). Of the 6 teachers, two teachers were from grade 1, two from grade 3, and two from grade 5.

TEACHERS PARTICIPATING IN VIDEOTAPED GRADE LEVEL DATA TEAM MEETINGS

The six classroom teachers, along with all the teachers in their grade level, were videotaped during their one-hour PLC grade level data team meeting.

RESEARCHER

The researcher was a credentialed employee of the school site. For the past four years, the researcher has been employed as the Literacy Resource Teacher. Therefore, the following precautions were taken to limit researcher bias to the study:

1. With structured interviewing, the researcher played neutral role and followed Fontana and Frey's (2005) interviewing guidelines that included a standard introduction and explanation of the study and sequence of questions or question wording. Interview protocols were used to ensure that each interview followed a standard form for conducting the interview.
2. Digital recordings from the interviews were outsourced and transcribed by an unaffiliated agency that did not know the names of the interviewees. Rather teachers were referred to as A, B, C, D, E, and F.

3. Member checks or respondent validations were performed after each round of interviews to ensure accuracy, credibility and validity. At the conclusion of the study, participants were provided with a summary of key findings.

The researcher received permission for the use of any copyrighted figures and the survey instrument, as well as approval from the International Review Board (IRB) from San Diego State University (see Appendices M and N).

Once the proposed study was approved, the researcher received approval from the Internal Review Board (IRB) at both affiliated universities and research approval from the district and the school where the study took place.

Setting

The school is a low-performing, high poverty school situated in southeast San Diego, one of the most economically challenged, government-assisted neighborhoods in a large urban district. The school operates on a traditional, single-track school year (10-month) calendar, and serves 666 kindergarten through fifth grade students, made up of a mixture of diverse socioeconomic and cultural groups.

At the time of the study, 79.4 percent of the students were Hispanic, 14.1 percent African American, 6.5 percent White/Caucasian, with 65.3 percent designated English learners. The school had a significant number of students eligible for free or reduced-priced meals, resulting in the school's Title 1 status. Eighty-seven percent of the students were certified eligible for free or reduced-priced meals.

STANDARDIZED ACHIEVEMENT DATA

The school, similar to all public schools in the nation, is accountable to adequate yearly progress goals and academic performance index goals.

ADEQUATE YEARLY PROGRESS

Beginning in the second grade, all students in California are annually assessed on English language and mathematics content performance standards. These annual assessments are part of the state's Standardized Testing and Reporting (STAR) accountability program. All schools in California receive an Academic Performance Index (API) that measures and ranks student performance on these assessments. Scores range from 200-1000, with 800 being identified as the statewide satisfactory performance target. All schools are expected to

show an annual growth of 5% from the school's targeted API goal. Schools are ranked by type (elementary, middle, and high school) and then categorized from lowest (1) to highest (10). Each school's API scores are then compared with other schools with similar characteristics such as mobility, ethnicity, socioeconomic status, percentage of English learners, percentage of fully credentialed teachers, and average class size (California Department of Education, 2008).

The school, similar to all public schools in the nation, is responsible for meeting No Child Left Behind accountability requirements, where 100 percent of the students are to achieve proficiency in English language arts and mathematics as measured by the STAR by 2014. School districts and individual schools must demonstrate *adequate yearly progress* (AYP) toward meeting that goal. Each state has adopted AYP requirements to comply with NCLB.

In California, three criteria are used in calculating AYP for elementary schools (California Department of Education, 2008):

Criterion 1: Percent Proficient. The school and all numerically significant subgroups at the school are required to demonstrate performance at or above the statewide annual measurable objectives (AMAOs) in English language arts and mathematics. For 2009 the AMAO for English was 56.8 percent and the AMAO for mathematics was 56 percent. The AMAOs should increase until they reach 100 percent in 2014. For grades 2–8 the California Standards Tests (CST) in English language arts and mathematics and the California Alternate Performance Assessment (CAPA) for students with the most significant cognitive disabilities are used to determine the percent who meet this performance or proficiency level. The CST and CAPA have five performance levels: *advanced (exceeding standards)*, *proficient (meeting standards)*, *basic*, *below basic* and *far below basic*. Students scoring at the *proficient* or *advanced* level are counted as *proficient or above* for AYP.

Criterion 2: Participation Rate. At least 95 percent of a school's students and numerically significant subgroup of students in grades 2–8, who are continuously enrolled from the California Basic Educational Data System (CBEDS) date to the first date of testing, must take the CST or CAPA.

Criterion 3: Academic Performance Index. Schools must show a targeted level of growth in its API score. For 2008, the school in this study must have achieved a minimum API of 620 *or* have demonstrated at least one point of growth in its API in comparison with the previous year.

From 2007–2010, the percentage of students school wide who scored *proficient or advanced* in English language arts (ELA) increased steadily and each of the school's

numerically significant subgroups demonstrated a similar pattern of improvement during the same period (see Table 4).

Table 4. Elementary School's 2007-2010 ELA AYP Progress

AYP Group	2007	2008	2009	2010
Schoolwide	27.4%	33.4%	38.5%	48.5%
Hispanic	16%	34%	41%	49.5%
English Learners	16%	20%	32%	47%
Socioeconomically Disadvantaged	24%	27%	33%	48.5%
Students with Disabilities	4.4%	6.3%	15.9%	26.7%

ACADEMIC PERFORMANCE INDEX

The school has consistently met the requirement of *Criterion 3* by meeting the minimum API score or growth target. This can be seen in the school's 2010 score of 789 as compared to the school's 2009 score of 740, representing a 49 point gain.

From 2007–2009, students have demonstrated continuous improvement in English language arts (ELA), as measured by the percentages of students achieving *proficient or advanced* on the CST. Figure 6 illustrates the school's progress in English language arts.

PROGRAM IMPROVEMENT

The STAR California Standards Test indicates student proficiency on grade level content standards. Consequently, students' results on the tests influence the school and student subgroup API and AYP results. Failure to meet AYP goals for two consecutive years results in being identified as a Program Improvement school and subject to improvement and corrective action measures. In 2004, the school failed to meet its school wide AYP growth target for one of its numerically significant subgroups, socioeconomically disadvantaged students. Consequently, this resulted in the school's entrance into Program Improvement status. By 2008, the school advanced further into Program Improvement Year 4. In 2009-

Figure 6. Elementary school's 2007-2010 CST ELA proficiency progress.

2010, the school met its API and AYP goals for two consecutive years and exited Program Improvement in 2010.

DATA MANAGEMENT

Since 2007, the school is using the district's web-based data management system for collecting and disseminating student assessment data to teachers. The data management system collects the scores of the state's English Language Arts standardized test, district Literacy Benchmark assessments, Fountas and Pinnell reading level data, and teacher-created assessments in literacy in the areas of spelling, phonics, phonemic awareness, high frequency words, word analysis, and reading comprehension. The system provides teachers with customizable performance reports for individual students and a group of students.

PROCEDURES

Five phases of data collection were utilized. Table 5 presents the research questions that guided the study indicating the purpose, assumptions and the multiple data sources collected to answer the research questions.

Table 5. Research Questions Guiding the Study

Research Question	Purpose	Assumption(s)	Data Collection Sources/Processes
1. In what ways do teachers' experience, knowledge of literacy and beliefs about literacy instruction influence teacher decision-making?	To determine data driven decision-making differences with teachers' subject matter knowledge and beliefs about literacy instruction.	Teachers will be able to make literacy-related decisions based prior knowledge and experiences.	<ul style="list-style-type: none"> • Teacher Surveys • Teacher Interviews • Videotaping of grade level meetings
2a. What literacy assessment information do teachers find useful and use more often?	To determine what literacy assessment is most valuable for teachers and why.	Teachers will easily identify which assessments they find useful and use more often.	<ul style="list-style-type: none"> • Teacher Surveys • Teacher Interviews • Videotaping of grade level meetings
2b. How do teachers determine interventions for a group of students and individual students based on data.	To determine the kinds of interventions teachers identify for individual and groups of students.	Teachers will easily be able to identify appropriate literacy-related instructional interventions.	<ul style="list-style-type: none"> • Teacher Surveys • Teacher Interviews • Videotaping of grade level meetings
2c. What kinds of interventions do teachers identify?	To determine the kinds of interventions teachers identify for individual and groups of students.	Teachers will identify interventions related to literacy.	<ul style="list-style-type: none"> • Teacher Surveys • Teacher Interviews • Videotaping of grade level meetings
3. What data driven decision-making differences exist between primary (K-2) and upper (3-5) teachers?	To determine data driven-decision making differences between primary and upper grade teachers.	Teachers will be able to make literacy-related decisions based prior knowledge and experiences. Grade level differences will not affect decision making.	<ul style="list-style-type: none"> • Teacher Interviews • Videotaping of grade level meetings • Videotaping of grade level meetings
4. What decision-making models do teachers use when making data-driven instructional decisions in literacy?	To determine what types of decision-making models teachers use when making data-driven instructional decisions in literacy.	Teachers use decision-making models when making data-driven instructional decisions in literacy.	<ul style="list-style-type: none"> • Teacher Interviews • Videotaping of grade level meetings

Phase 1

The staff received a five-minute presentation describing the research study. The presentation was in August during the school's teacher preparation days in the school's professional development room. At the conclusion of the presentation, recruitment materials were distributed to teachers (see Appendix A). The materials outlined the nature of the study, the risks, confidentiality, benefits, compensation, and information regarding discontinuing the study at any time. Teachers were then informed of a follow-up meeting in which they were asked to participate in a web-based 5-part survey (see Appendices B and C) meant to collect information on:

- Participants' background and experiences
- Types of student assessments administered in literacy
- Types of student literacy assessments analyzed
- Types of decisions made about struggling readers
- Whether changes in teachers' instructional practice occur as a result of literacy assessment results and data analysis.

The follow-up meeting took place in August during the school's teacher preparation day in the school's computer lab to ensure that every teacher in the building has access to the web-based survey created from Survey Monkey. On the web-based survey, the researcher provided participants with an introduction to the survey (see Appendix B). Upon entering the computer lab, the researcher assigned each teacher a random number for purposes of anonymity and asked teachers to input the number when prompted to on the survey. No time limit was set for completing the survey.

Phase 2

The researcher employed stratified random sampling to select teachers for the interviews. The use of stratified random sampling resulted in a targeted small group of participants whose experiences with data use and analysis provided a rich, in-depth experiential account of the ways in which teachers make use of data for literacy related instructional decision making use in schools. The researcher selected a total of six elementary teachers, comprising two teachers from grade 1, two teachers from grade 3, and two teachers from grade 5. These teachers were asked to participate in the interviews during phases 3-5. All six teachers agreed to participate in the interviews. The researcher assigned

the following alphabetical codes to each teacher as follows: First Grade Teachers = A, B; Third Grade Teachers = C, D; Fifth Grade Teachers = E, F.

Phases 3-5

The researcher conducted a total of three separate interviews with each participant selected for the interviews, resulting in a total of 18 interviews (see Figure 7). Each interview followed an interview protocol (see Appendix E) to ensure a standard form of conducting each interview, along with protocol recommendations from think-aloud research that suggests participants practice thinking aloud on a mock task before they begin the real task. For the mock task, teachers were asked to choose between a primary or an upper grade students' writing sample (see Appendix D) and asked to analyze the writing sample using the think-aloud method. Effective prompting methods such as "keep talking" and "what are you thinking?" instead of "Why did you do that?" were used when participants remained silent for more than 30 seconds during the task (Young, 2005). During each interview, teachers were presented with different fictitious student case reports (see Appendices F-L) consisting of multiple literacy assessment information. Each session focused on different interpretations of literacy assessment data. For Interview 1, teachers were presented with three different kinds of group data and asked to choose the assessment they would like to analyze. The three different kinds of group data included the District's Literacy Benchmark data, a Houghton Mifflin Summative Assessment data, and a class reading level report (Fountas and Pinnell Instructional Reading Level) of students' independent reading levels and recommended reading strategies and behaviors for instruction.

DATA ANALYSIS

Both quantitative and qualitative data analysis were used for this study.

Quantitative

The researcher first sorted and analyzed the quantitative data. The random number that was assigned to participants during Phase 1 of the study identified the surveys. The researcher used SPSS, a computer program for statistical analysis, as well as services from a professional statistician. The survey responses were post coded, tabulated, and analyzed using SPSS.

Figure 7. Phases of data collection.

Data analysis consisted of descriptive statistics and frequency distributions. In addition, independent samples t tests were also used to determine differences in type of literacy assessments administered by grade taught. Furthermore, survey questions 2-8 were analyzed using a Chi-square analysis to determine differences in assessment by grade taught.

Qualitative

After collecting and transcribing the verbal protocols gathered from process tracing during the structured interviews, Chi (1997) and Payne's (1994) steps for analysis of verbal data were utilized. The steps included: segmenting the protocols, developing a coding scheme, identifying patterns and interpreting the patterns. From the verbal utterances, the researcher first identified what constituted a unit of analysis and then segmented the protocols so that each segment could be coded independently. For the purposes of the study, the unit of analysis included large units of analysis (spanning several sentences) such as an episode or a reasoning chain in order to understand teachers' thought processes when analyzing literacy assessment data. The researcher then used Miles and Huberman's (1994)

coding scheme. Once the data were coded, the researcher presented the data in a tabular form using Microsoft excel so that the researcher could identify patterns in the data. Videotapings were also analyzed using Miles and Huberman's (1994) coding scheme.

CHAPTER 4

FINDINGS

The purposes of this study were to investigate and describe the ways in which teachers at the elementary level use multiple types of literacy data, and to investigate the types of decisions teachers make with the data to accelerate student achievement in literacy. This chapter will contribute to the literature on teachers' instructional decision making (Shavelson & Stern, 1981; Shulman & Elstein, 1975) and data-driven decision making (Marsh et al., 2006) that was discussed in Chapter 2.

RESEARCH QUESTIONS

Four main research questions guided this study:

1. In what ways do teachers' experience, knowledge of literacy and beliefs about literacy instruction influence teacher decision-making?
2. How do teachers make data-driven instructional decisions in literacy?
 - a. What literacy assessment information do teachers find useful and use more often?
 - b. How do teachers determine interventions for a group of students and individual students based on data?
 - c. What kinds of interventions do teachers identify?
3. What data-driven decision-making differences exist between primary (K-2) and upper grade (3-5) teachers?
4. What decision-making models do teachers use when making data-driven instructional decisions in literacy?

BACKGROUND FOR THE STUDY

To explore the data-driven instructional decisions made by classroom teachers using literacy assessment data, this will be a phenomenological study using multiple measures including a web-based group administered survey, stratified random sampling for structured interviews and videotaping of grade level data analysis team meetings.

Twenty-seven teachers participated in the web-based survey intended to collect information about participants' experience and knowledge with assessment and literacy. Of

the 27 teachers, stratified random sampling was used to select six classroom teachers, two from grade one, two from grade three, and two from grade five, to participate in structured interviewing to further reveal how teachers make data-driven decisions in literacy, as well how their beliefs and perceptions about assessment, literacy, and instruction influence decision making. Of the 27 teachers, five first grade teachers, five third grade teachers, and four fifth grade teachers participated in videotaped grade level data team meetings intended to provide a rich in-depth description of the data-driven decision making models teachers utilize.

The chapter is organized into the following sections: a review of the data collection, findings from quantitative analysis of the survey data, followed by a qualitative analysis from the survey, interviews, and videotaped data team meetings that are interrelated to the quantitative findings for each research question, and an overall chapter summary. Each of these sections will contain results pertinent to the four research questions of the study.

DATA COLLECTION

Quantitative and qualitative data collection sources were used for this study.

Participant Surveys

The purpose of the survey was to collect quantitative data on the following:

- Participants' demographic information
- Types and frequencies of student assessments administered in literacy
- Types and frequencies of student literacy assessments analyzed and methods used
- Whether changes in teachers' instructional practice occurred as a result of literacy assessment results and data analysis

The survey was organized into five parts. Parts One and Two included close-ended questions comprising of categorical questions and Likert scale questions using a matrix design of the types of assessments administered and methods of data analysis. Part Three included yes or no questions related to whether changes have been made in instructional practice as a result of assessment data and data analysis. Part Four included both multiple-choice and open-ended questions adapted from Plake et al.'s (1993) instrument. The questions were related to how teachers choose and develop assessment methods, administer, score and interpret assessment results. Part Five included two student scenarios describing

typical struggling readers with an open-ended question asking teachers for literacy-related instructional recommendations for the struggling readers. The student scenarios were adapted from Moore's (2004) instrument that collected data on how teachers' diagnose students' reading strengths and needs and plan for differentiated instruction. Twenty-seven teachers participated in the web-based survey.

Participant Interviews

Of the 27 teachers who participated in the web-based survey, stratified random sampling was used to select six classroom teachers, two from grade one, two from grade three, and two from grade five to participate in structured interviewing. The purpose of the interviews was to obtain a rich, in-depth experiential account of individual teachers use of data in literacy. A process tracing approach was used during the interviews. Using this approach, teachers were presented with fictitious student case reports containing multiple literacy assessment information for a group of students and an individual student and were then asked to "think aloud" as they analyzed the data. These "think alouds" or verbal reports of evaluating student performance and reaching a decision related to instruction and intervention were analyzed.

Videotaped Grade Level Data Team Meetings

Each Professional Learning Community (PLC) included both teachers who participated in the interviews and other teachers who taught in that grade level. Of the 27 teachers who participated in the web-based survey, five first grade teachers, five third grade teachers, and four fifth grade teachers, participated in videotaped grade level data team meetings. The purpose of the videotaped grade level data team meetings was to obtain a rich, in-depth experiential account of how grade level teams analyze data in literacy in order to reveal and describe data-driven decision making models. Since participants selected for this study were involved in Professional Learning Communities and met one day a week for one hour, they were videotaped on one occasion with their grade level team during a data analysis meeting. The videotapings took place in the fall and coincided with the 2009-2010 California standardized testing data.

DATA ANALYSIS

Data analysis will include results pertinent to the four research questions of the study.

Research Question 1. In What Ways Does Teachers' Experience, Knowledge of Literacy and Beliefs about Literacy Instruction Influence Teacher Decision-Making?

The survey and interviews were used to answer this research question. The quantitative analysis indicated differences in how teachers analyzed data and teachers' knowledge of assessments in literacy. The qualitative data further revealed teachers' beliefs about the role of assessment in literacy instruction and perceptions about themselves as decision-makers.

TEACHERS' EXPERIENCE

The survey responses were post coded, tabulated, and analyzed using SPSS. The demographic information for the respondents is reported in Table 6. There were a total of 27 respondents. More than half of the respondents (59.2%) taught kindergarten, first grade, or second grade. More than half of the respondents (55.6%) had been teaching 6-10 years; only 14.8% had been teaching fewer than 5 years. More than half of the respondents (51.9%) had a bachelor's degree; 48.1% had a master's degree.

TEACHERS' KNOWLEDGE OF ASSESSMENTS IN LITERACY

Part Four of the survey, adapted from Plake et al.'s (1993) instrument, included multiple-choice questions related to choosing, developing, administering, scoring, and interpreting literacy assessment results. The purpose of this part of the survey was to evaluate teacher's knowledge of assessment and to draw conclusions about whether their knowledge base influences decision-making. Respondents were required to read each item carefully and select the best response. Each item was scored for correctness (best response) using a scoring key.

Table 6. Demographic Information

N = 27	N
What grade do you currently teach?	
Kindergarten	4
First grade	5
Second grade	7
Third grade	5
Fourth grade	2
Fifth grade	4
Total Respondents	27
How many years have you been teaching?	
Fewer than 5 years	4
6-10 years	15
11-15 years	1
More than 15 years	7
What is your highest degree attained?	
Bachelor's	14
Master's	13

CHOOSING ASSESSMENT METHODS

Respondents were asked on the survey, “What factor do you consider most important when choosing a method for assessing student reading performance?” The findings are presented in Table 7. The majority of respondents (70.4%) selected the answer “alignment with instructional objectives,” (which was the best response). 29.6% of the respondents selected the incorrect answer. Of the 29.6%, 25.9% reported that the type of diagnostic information provided by the assessment was most important to them, while 3.7% reported

Table 7. Responses to “What Factor Do You Consider Most Important when Choosing a Method for Assessing Student Reading Performance?”

N = 27	Response Percent
Ease of preparing and administering the assessment	3.7
Ease of scoring the assessment	0.0
Alignment with instructional objectives ^a	70.4
Type of diagnostic information provided by the assessment	25.9

^a Best response.

that the ease of preparing and administering the assessment was most important to them. All respondents agreed that the ease of scoring the assessment didn't matter to them.

Another item on the survey meant to investigate and evaluate teachers' knowledge of assessments included asking respondents to select an appropriate assessment for an English language arts Reading Comprehension standard. On the survey, respondents were told that Mrs. Bruce wishes to assess her students' understanding of identifying the main idea of a nonfiction passage that she has been teaching. They were asked to report the assessment strategy they would be most likely to use if they were Mrs. Bruce. The findings are reported in Table 8. Most of the respondents (55.6%) selected the answer "develop an assessment consistent with what was actually taught in the class" (which was the best response). A total of 44.4 percent of the respondents selected the incorrect answer. These respondents reported the most appropriate assessment would be to select a standardized test that provides a score on identifying the main idea. All respondents reported that they would not utilize a publisher-created assessment or measure students' attitudes about finding the main idea as an appropriate assessment strategy.

Table 8. Responses to "Which Assessment Strategy Would You Be Most Likely to Use if You Were Mrs. Bruce?"

N = 27	Response Percent
Select a textbook that has a "teacher's guide" with a test developed by the authors.	0.0
Develop an assessment consistent with what was actually taught in the class. ^a	55.6
Select a standardized test that provides a score on identifying the main idea.	44.4
Select an instrument that measures students' attitudes about finding the main idea.	0.0

^a Best response.

DEVELOPING ASSESSMENT METHODS

Respondents were told that a teacher wants to document the validity of the scores from a classroom assessment strategy she plans to use for assigning grades on a class unit.

They were asked to report the kind of information that would provide the best evidence for this purpose. The findings are reported in Table 9. The majority of respondents (88.9%) selected the answer “match an outline of the instructional content to the content of the assessment strategy,” (which was the best response).

Table 9. Responses to “What Kind Of Information Would Provide the Best Evidence for This Purpose?”

N = 27	Response Percent
Have other teachers judge whether the assessment strategy covers what was taught.	11.1
Match an outline of the instructional content to the content of the assessment strategy. ^a	88.9
Let the students in the class indicate if they thought the assessment was valid.	0.0
Ask parents if the assessment reflects important learning outcomes.	0.0

^a Best response.

ADMINISTERING AND SCORING LITERACY ASSESSMENT RESULTS

Respondents were told that at the close of the first month of school, Mrs. Friend gives her fifth grade students a test she developed on comparing and contrasting folktales. Her test is modeled after a standardized reading comprehension test. It presents passages and then asks questions related to comparing and contrasting. When the test was scored, she noticed that two of her students, who had been performing well in the class, scored a lot lower than other students did. The respondents were asked to report which of the following types of additional information would be most helpful in interpreting the results of this test. The findings are reported in Table 10. Only 44.4% selected the answer “reading comprehension scores for the students,” (which was the best response). 55.6 percent of the respondents felt that reliability data for the standardized reading comprehension test would be most helpful in interpreting the results of this test. None of the respondents felt that the gender of students and the age of students would be helpful.

Table 10. Responses to “Which Would Be Most Helpful in Interpreting the Results of This Test?”

N = 27	Response Percent
The gender of the students.	0.0
The age of the students.	0.0
Reliability data for the standardized reading comprehension test she used as the model.	55.6
Reading comprehension scores for the students. ^a	44.4

^a Best response.

The survey item showed that respondents were more concerned with the reliability data for the standardized reading comprehension test that the teacher used as a model to created her teacher-generated assessment rather than students’ reading comprehension scores. These results suggest that as teachers analyze assessment data and interpret results, teachers tend to question the validity of the assessment itself rather than seeking more data to compare results-multiple measures or looking at different data sources to confirm or disconfirm student results. Results also indicate that respondents were not concerned with the fact that the two students described in the example had been performing well in the classroom. This suggests that these teachers place more value on standardized testing results rather than on observation data from day-to-day classroom instruction.

INTERPRETING LITERACY ASSESSMENT RESULTS

Another item on the survey meant to evaluate teachers’ knowledge of assessment, particularly how teachers interpret assessment results included the following: respondents were told that Frank, a beginning fourth grader, received a G.E. (grade equivalent score) of 3.0 on the Reading Comprehension subtest of a standardized test. Respondents were asked to interpret what that score meant. The findings are reported in Table 11. Only 26.9% of the respondents interpreted that the score means that Frank scored as well as a typical beginning 3rd grader scored on this test (which was the best response). A significant number of respondents (61.5%) interpreted that the score meant that Frank, a beginning fourth grader, is performing in Reading Comprehension at the 3rd grade level. 11.5% of the respondents

Table 11. Responses to “This Score Should Be Interpreted to Mean that Frank:”

N = 27	Response Percent
Can read and understand 3rd grade reading level material.	11.5
Scored as well as a typical beginning 3 rd grader scored on this test. ^a	26.9
Is performing in Reading Comprehension at the 3 rd grade level	61.5
Probably reached maximum performance in Reading	0.0

Table 11 (continued)

Comprehension at the beginning of the 3rd grade

^a Best response.

interpreted that the score meant that Frank, a beginning fourth grader, can read and understand 3rd grade reading level material. None of the respondents interpreted that the score meant that Frank, a beginning fourth grader, would probably reach maximum performance in Reading Comprehension at the beginning of the 3rd grade.

Responses different from the best response illustrates teachers’ misinterpretation of and unfamiliarity with the common assessment term “grade equivalent score” or raw score that the assessment results indicated. This term is frequently seen in standardized assessments that indicate where a student’s test score falls along a continuum. The grade equivalent score is expressed as a decimal number: in this example, 3.0. The digit to the left of the decimal represents the grade; in this case, grade 3. The digit to the right of the decimal represent the month; in this case, month 0 – indicating the beginning of the school year based on 10 months per school year. The grade equivalent score of any given raw score indicates the grade level at which the “typical” student earns this raw score. Seventy-one percent of the respondents misinterpreted the results and felt that grade level equivalent was related to reading 3rd grade level texts or lexile reading measures. This suggests that teachers’ knowledge of assessment literacy is in question. Results indicate that the term “grade equivalent score” was a misunderstood measure of student achievement.

USING ASSESSMENT RESULTS FOR DECISION MAKING

Respondents were told that Ms. Camp is starting a new unit on nonfiction with her 3rd grade class. Before beginning the unit, she gives her students a test on identifying the text features and structures of nonfiction. The respondents were asked to report which of the following is the most likely reason she gives this test to her students. The findings are reported in Table 12. All respondents (100.0%) reported Ms. Camp wants to measure growth in student achievement of these concepts, and scores on this test serve as the students' knowledge of baseline (which was the best response).

Table 12. Responses to “Which of the Following Is the Most Likely Reason She Gives This Test to Her Students?”

N = 27	Response Percent
The teacher needs to report the results of this assessment to the principal.	0.0
Ms. Camp wants to give the students practice in taking tests early in the school year.	0.0
Ms. Camp wants to report the results of this assessment to the students.	0.0
Ms. Camp wants to measure growth in student achievement of these concepts, and scores on this test serve as the students' knowledge of baseline. ^a	100.0

^a Best response.

Quantitative Analysis Summary for Research Question 1

A summary of the survey data regarding how teachers administer, score and interpret assessments results revealed that teachers' demonstrated the greatest knowledge in choosing and developing literacy assessments. The qualitative data from the structured interviews further explores teachers' experience and knowledge of the role of assessment in literacy instruction.

Qualitative Data for Research Question 1

The qualitative data revealed four themes.

THEME ONE: TEACHERS SHARED COMMON BELIEFS ABOUT THE ROLE OF DATA IN TEACHING

To further explore the way in which teachers' experience and knowledge of literacy and beliefs about literacy instruction influence teacher decision-making, it was necessary to examine participants' beliefs about the role of assessment in literacy instruction, how assessments influence participants' literacy instruction, and participants' experience with learning how to analyze literacy data.

During the interviews, the six participants were asked to explain what the role of assessment should be in literacy instruction and in what ways assessment influences their instruction. All six teachers reported that the role of assessment in literacy instruction should be to inform instruction and to inform student progress. A typical response was, "I think the primary goal is to guide instruction so you best serve your students' needs," or "To me, the main goal of it is to tell me what I need to teach them and if they've learned what I taught." Similarly, a fifth grade teacher responded, "It pretty much drives the instruction. Once I look at the results of the assessment, it will refine and help me make my next decisions for my next steps." Moreover, a third grade teacher described the importance of ongoing assessment. She explained, "I think it's essential that you assess, you assess as you're teaching, you assess after you teach a lesson, you assess maybe at the end of the week, and then you assess at the end of the unit."

Teachers' reported perceptions about data use in teaching agree with the quantitative findings from the survey items meant to assess teachers' knowledge of assessment. If teachers believe that the role of assessment is to inform instruction, then one would predict that teachers would choose and develop assessments that match their instruction. The quantitative data clearly demonstrated that teachers were most proficient in these areas. One way to think about such a hypothesis would be to acknowledge that teachers share a common goal about teaching and learning – the need to align curriculum, instruction, and assessments.

THEME TWO: TEACHERS SAW THEMSELVES AS INTUITIVE STATISTICIANS

Based on teachers' beliefs about assessments and teaching, all six teachers believed that that they were intuitive statisticians, routinely collecting data and instinctively making

decisions about student learning. This finding supports Shavelson and Stern's (1981) and Shulman and Elstein's (1975) work on instructional decision making that found that teachers' have the ability to recommend or use many instructional techniques or strategies at their disposal to improve student achievement.

The interview data illustrated how teachers portrayed themselves as having the ability to constantly engage in assessment-related activities throughout student learning. One third grade teacher described the use of observational data combined with formal and informal assessment data to make instructional decisions:

I'm constantly assessing. I'm watching kids' faces when I'm teaching a lesson. I'm thinking about their responses and thinking OK which direction do I go? When I do an exit slip or an informational assessment or even a writing assessment, I'm walking around and I'm thinking, OK what did they get out of this, what could I have done differently? And then when we get to the more formal assessments like the benchmarks, I would be looking at OK, what standards do they show mastery of, what standards do they need more work on? What do I need to re-teach? What do I need to hit again?

Another third grade teacher reported the use student feedback as a way to collect data and make instructional decisions during a lesson:

OK. So, when I'm in the classroom, when I'm teaching within the lesson, I provide opportunity for the students to give feedback. They may be asked to say something or write something. I'm listening to students' responses and I'm assessing. I'm reading what they wrote. Then I'm like, OK, those are my next steps in teaching. This is what they got (learned) and this is what they didn't (learn).

During the interview, a fifth grade teacher looked at students' reading level data and automatically began talking about homogenous grouping as the next step for instruction:

OK. Well it looks like there's quite a few level M's (instructional reading level M). I know that at level M, students need to understand how tone and imagery contributes to meaning. So, I might pull a small group of them, these five kids here (pointing to student names) and pull them to the back table and then obviously find a text that would match that kind of strategy. I would have them get into a conversation about what tone is, what imagery is, and how that helps us understand a text.

THEME THREE: TEACHERS COULD NOT RECALL ANY FORMAL TRAINING IN LEARNING HOW TO ANALYZE DATA

Participants were asked about their experiences with learning how to analyze data in an attempt to better understand how teachers' experience with data analysis influences teacher decision-making. Prior to the study, participants at the school had received on-site training by the principal and literacy coach on a set of guidelines and rules for how to look at data. The training occurred during teacher collaboration time and coincided with relevant data that had to be analyzed. The training focused on outlining a set of guidelines for how to look at data such as the importance of first looking at areas of strength and then identifying areas of weaknesses, selecting an area of need to prioritize instruction on, and discussing instructional strategies related to the area of need. The school had adopted the set of guidelines as their "data protocol" to be used throughout the school year when looking at data. Despite this training, compelling evidence of a lack of formal assessment training in data analysis was revealed when teachers were unable to recall district or other school-based training related to data analysis. A first grade teacher who had been at the school for nine years reported, "My experience with learning how to analyze data was done in teacher collaboration together with my grade level. The data were introduced and then we looked through it together."

Other responses described standards-based instruction analysis, where teachers deconstructed individual English language arts standards by identifying specific literacy-related strategies and skills necessary for demonstrating proficiency for each standard.

One first grade teacher discussed the site's training with an outside consultant, but that it only focused on state standards and becoming proficient in analyzing the standard or deconstructing the standard to help plan lessons.

When Michelle (pseudonym) came down. It was very explicit and direct and we broke down the standards. We really analyzed them and deconstructed them. We pulled out the verbs and such, that really brought to life what the standards really meant and what they (students) were supposed to do.

When it came to learning about specific literacy-related assessments, typical responses included recalling the district's reading assessments, such as the Developmental Reading Assessment or the Analytical Reading Inventory. As teachers described the assessments, all but one of the participants described how experienced they were with

collecting literacy data and administering the data, but were not as trained in knowing what to do with the data. A first grade teacher who reported not being trained in knowing what to do with the data reported

When I first started teaching, I learned how to teach reading with running records. I have to admit that in the training it was always really interesting, but then when it came to the classroom, it was like harder to do and I didn't know what to do with the data.

The third grade teacher, who reported having formal training, described the importance of the use of miscue analysis to diagnose individual student's reading. Another participant expressed how the use of running records yields valuable information about students' attitudes towards reading but is often neglected in the classroom.

Well, I wish we did more of them. I think they're a great insight into a student. So much of what you see with a running record, you can see the body language, the eye movement, there's so much more going on then just the actual record itself and that provides a lot of detailed information. But, you need to have that one on one time and that is really a rare thing these days.

When participants were asked during the interview to choose a running record case report and asked to analyze the data, the participant who had formal training concluded,

I wouldn't be terribly concerned. For the most part, the errors they're making don't distort the meaning. One is with tense, one is a contraction, and one they fixed. The only one (error) that really stands out is 'but mom said, "I want responsible enough.' For comprehension, well I would wonder if the key understandings are missing or related to the errors but I doubt it considering what's going on here.

The teacher asked, "Is it because they don't have the graphophonics? Is it because they don't understand the language structure, what's going on, what's keeping them from reading?"

Two fifth grade teachers felt that running records were not as important or valuable in the upper grades, feeling that they were more useful in the primary grades. One fifth grade teacher stated, "My experience with running records is that when I taught first grade, it was extremely helpful." She said,

I don't feel like they're as useful in upper grade. I think for a lot of different reasons. The texts are longer and harder. Hopefully most of your kids aren't having the same kind of word attack skills that a first grader has. Our standards are so much more based on comprehension. I think running records help you diagnose decoding or problems at the word level or sentence level. They don't help you assess comprehension.

These responses may indicate that, as a result of no formal training on running records, participants could not distinguish how each component of a running record (word recognition, reading fluency, reading strategies, reading comprehension, and miscue analysis) provides valuable information about students as readers across all grades.

This conclusion is startling as quantitative data analysis findings from the survey reported that 50% of the participants rated running records as important. However, the qualitative data from these interviews contradicts this finding, as only one participant described the role of miscue analysis, while two fifth grade teachers could not demonstrate an understanding of the components of a running record.

In reviewing the quantitative data, of the 50% of the participants who rated running records as important, unanswered questions remain about participants' data use with running records. Do they have enough knowledge on running records as an assessment tool, and using the data to inform their reading instruction? What instructional decisions in literacy or about students are they making once they get the data? How do these data influence their teaching in literacy? What components of a running record do they find important or useful? How can the school make the assessment results more useful to the fifth grade teachers (or others) who do not have convincing evidence that the assessment is useful?

When participants were asked about the role of running records in literacy instruction (during the interviews), similarities among the six participants emerged despite the variability in training. All six reported that the primary role of running records is to gather information about individual readers by identifying areas of need for that individual student and to provide differentiated instruction for each student. Here, we see a reoccurring theme among the six participants in their beliefs about the role of data in teaching, as well as contradictory findings with what they believe and what they actually *know* and *do* with data.

It appears that while teachers understand the importance of literacy assessments in teaching and learning, can choose and develop assessments, they struggle with scoring and interpreting assessments and expressed having had little formal training in assessment, literacy assessments, and data analysis.

THEME FOUR: TEACHERS REPORTED THE USE OF FORMAL AND INFORMAL ASSESSMENTS

Participants were asked to describe some of the literacy assessments they use in their classrooms and discuss the kinds of information that the assessments provide. Results revealed that participants utilized a variety of formal and informal assessments in their classrooms such as: district benchmarks, running records, formative assessments such as exit slips or quizzes, grade level-generated assessments (common formative assessments), writing assessments, and fluency assessments. All teachers reported the use of the district benchmarks and grade level-generated assessments (common formative assessments). The first grade teachers reported using district benchmarks and formative assessments such as exit slips and grade level-generated pre and post assessments (common formative assessments). The third grade teachers reported using district benchmarks, grade level-generated assessments (common formative assessments), running records, and writing assessments. The fifth grade teachers reported using district benchmarks, grade level-generated assessments (common formative assessments), reading comprehension and fluency assessments, and writing assessments.

A fifth grade teacher explained about the importance of authentic assessments, “Well, I use a lot of different kinds of assessments. Sometimes, like right now we worked on transitional phrases so I’ve asked them to use them in their writing to see if they understand the purpose of it.

The other fifth grade teacher reported the importance of comprehension and fluency checks,

A lot of times, I’ll just even go and sit with a kid and listen to them read. We’ll talk about the text. From that I think it gives you a lot of information. Sometimes kids are just slower readers and it doesn’t necessarily mean that they don’t get it.

Findings revealed that when teachers develop formative assessments such as teacher or grade level-generated assessments (common formative assessments) they tend to include items that align with standardized testing – paying careful attention to its format, testing language, and the rigor of standardized testing. A third grade teacher reported, “Well assessments are definitely related to the standards and so that’s what we’re teaching and that’s what they’re tested on. It’s kind of like getting them ready for CST.” Again, the data

here point out a recurring theme among participants and their beliefs about aligning curriculum, instruction, and assessment.

Qualitative Analysis Summary for Research Question 1

In summary, qualitative findings revealed similar themes about how teachers felt about the role of assessment in literacy instruction, perceptions about themselves as decision makers, and how teachers' beliefs, experiences and knowledge about assessment and literacy assessments influence decision making.

It was evident from both the quantitative and qualitative data that while all participants shared a common belief about the alignment with data and teaching, participants' knowledge in assessment (choosing, developing, administering, scoring and interpreting), literacy assessments (particularly running records), and data analysis suggest that teachers' knowledge and beliefs about literacy do play a role in the types of assessment information teachers use and what they do with the data. It appeared that the relationship between teachers' beliefs and practices in literacy instruction and assessments did not correspond with each other. The qualitative data helped explain this mismatch. One explanation for the mismatch could be attributed to those teachers who exhibited contradictions about running records in their interviews. The interview data showed that there were instances where teachers could not describe the role of miscue analysis in running records nor could not recall formal training in literacy assessments and data analysis. These contradictory findings of the data may indicate that what teachers' believe may actually be different from what they *know* and what they actually *do* with literacy data.

Research Question 2a: What Literacy Assessments Do Teachers Find Useful and Use More Often?

The survey, interviews, and videotaped data team meetings were used to answer this research question. The quantitative analysis indicated information about the type of literacy assessment information teachers found most useful and used most often. The qualitative analysis confirmed the results indicated from the quantitative data. Also, the findings revealed that teachers felt that assessments should be aligned with classroom instruction and that several characteristics were important to teachers when analyzing literacy data.

LITERACY ASSESSMENTS MOST USEFUL TO TEACHERS

A frequency distribution from all 27 participants' responses were generated using the survey data to examine which type of literacy assessment teachers found most useful. The different types of assessments described included: standardized assessments, district benchmark assessments, grade level-generated assessments (common formative assessments), and running records.

Results indicated grade level-generated assessments (common formative assessments) were extremely important to teachers with 92.3% selecting this type of assessment as extremely important or important (see Table 13).

Table 13. Responses to Rating the Following Assessments in Order of Importance

N = 27	Extremely important %	Important %	Doesn't matter much %	Least important %
Standardized assessments	33.3	55.6	11.1	0.0
District benchmark assessments ^a	19.2	65.4	0.0	15.4
Grade-level created assessments (common formative assessments) ^a	57.7	34.6	7.7	0.0
Running records ^a	23.1	50.0	7.7	19.2

^a Contained missing data.

The importance of this type of assessment can be seen in how often teachers administered this type of assessment, with 77.4% reporting administering them on a monthly basis (see Table 14).

Findings for Research Question 1 revealed that teachers shared a common belief about data and teaching – aligning curriculum, instruction, and assessment. Since grade level-generated assessments (common formative assessments) are formative and meant to be aligned to classroom instruction, it is not surprising that these types of assessments were

Table 14. Responses to “How Often Do You Administer the Following Assessments in Your Classroom?”

N = 27	Weekly	Monthly	Quarterly	Annually	Never
	%	%	%	%	%
Running records	18.5	22.2	33.3	14.8	11.1
Miscue analysis ^a	23.1	30.8	26.9	3.8	15.4
Word lists	51.9	25.9	11.1	0.0	11.1
Letter identification ^a	50.0	7.7	3.8	3.8	34.6
Phonemic awareness ^a	64.0	4.0	8.0	4.0	20.0
Fluency ^a	53.8	19.2	15.4	3.8	7.7
Retelling ^a	62.5	20.8	12.5	0.0	4.2
Teacher-generated literacy assessment	29.6	44.4	11.1	0.0	14.8
Grade-level generated literacy assessment (common formative assessments)	7.4	70.4	18.5	0.0	3.7

^a Contained missing data

reported as extremely important to teachers and were administered more frequently throughout the year.

While District Benchmarks (administered three times a year or every reporting period) and Standardized assessments (administered annually) are administered less frequently than grade-level generated assessments (common formative assessments), they

were still rated as important to teachers, with 89% selecting District Benchmarks as important and 85% reporting Standardized assessments as important.

15.4 percent of the respondents reported District Benchmark assessments as least important and 19.2% of the respondents reported running records as least important. It is not surprising that more than 80% of the participants reported standardized tests as important. In fact, these findings confirm findings for Research Question 1 that revealed how teachers perceive standardized tests as a way to align curriculum, instruction, and assessments. These perceptions can be seen in how often teachers generate common formative assessments that align with standardizing testing – paying careful attention to its format, testing language, and rigor of testing.

Furthermore, teachers' perceptions about standardized tests can explain why earlier when participants were asked to choose an appropriate assessment to assess main idea (from findings for Research Question 1), 44% reported select a standardized test. This reveals those standardized tests are important to teachers.

LITERACY ASSESSMENTS USED MOST OFTEN BY TEACHERS

A frequency distribution was generated using the survey data to examine the literacy assessments teachers used most often. The different types of classroom assessments described in this study included: running records, miscue analysis, word lists, letter identification, phonemic awareness, fluency, retelling, teacher-generated assessments such as quizzes or exit slips, and grade-level generated assessments (common formative assessments).

Responses regarding the frequency of administering assessments in their classrooms are presented in Table 14. As seen in Table 14, 77% administered running records quarterly, 54% administered miscue analysis monthly, 51.9% administered word lists weekly, 50.0% administered letter identification weekly, 64.0% administered phonemic awareness weekly, 53.8% administered fluency weekly, 62.5% administered retelling weekly, 74% administered teacher-generated literacy assessment monthly, and 77% administered grade-level generated literacy assessment (common formative assessments) monthly. Grade-level generated literacy assessments (common formative assessments) were the most frequent assessments

administered. The next most frequent assessment administered were phonemic awareness assessments. Results showed 64% of teachers reported administering them on a weekly basis.

The use of running records and miscue analysis as assessment tools come into question with the survey data, as earlier it was suggested that a “knowing and doing” gap existed among participants, particularly with the use of miscue analysis. Quantitative data reported here indicates that participants felt that running records were important. However, Research Question 1 revealed a mismatch from the qualitative data interviews that contradicts the findings reported here. When participants were asked about its (running records) role in literacy instruction during the interviews, all six reported that the primary role of running records is to gather information about individual readers by identifying areas of need for that individual student and to provide differentiated instruction for each student. All, but one, pointed out miscue analysis, which is a subset of running records.

QUANTITATIVE ANALYSIS SUMMARY FOR RESEARCH QUESTION 2A

The results of this statistical analysis served as one measure in investigating the ways in which elementary teachers use literacy data, particularly what literacy assessments teachers found useful and used most often. In summary, quantitative results indicated that teachers prefer grade level-created assessments (common formative assessments) and administer these types of assessments most frequently. To further describe how teachers make data-driven instructional decisions in literacy, qualitative data from the structured interviews were analyzed to identify patterns and themes with regards to data-driven decision making and the relationship between assessments and classroom instruction.

QUALITATIVE DATA FOR RESEARCH QUESTION 2A

The qualitative data revealed three themes.

Theme One: Participants’ Common Beliefs Were Confirmed when They Favored Common Formative Assessments

The 27 participants were asked on the survey to rate different types of literacy assessments in order of importance (see Table 13) and asked to respond an open-ended

question, “Why do you value this type of assessment?” More than half of the respondents in the survey felt that grade level-created assessments (common formative assessments) were extremely important and 35% more stated them as important. This may suggest that participants trust their own assessments rather than external assessments. One respondent in the open-ended question described the importance of having immediate feedback about student learning. She stated, “Common formative assessments lets me know right away where they’re at and then the post assessment reveals how much instruction actually took hold. The formative lets me see the building that took place.” Another respondent answered, “The reason why we need it is how I use it, so to inform instruction.” The use of data to inform instruction reemerged as a common theme among the open-ended responses. For example, a third grade teacher reported, “I think it’s (common formative assessments) is a key role. It guides your instruction, and if there isn’t any type of data to show progress or holes, then you really can’t specify your instruction to meet each need of each child.” Another participant went on to describe how the use of data are essential to teaching. She proposed,

I think it’s essential that you assess, you assess as you’re teaching, you assess after you teach a lesson, you assess maybe at the end of the week, and then you assess at the end of the unit. But I think assessment is just essential to see where the kids are, how much they’ve got and what you need, where you need to go next.

While more than half of the respondents felt that common formative assessments were valuable and administered these more often, 33.3% felt that standardized assessments such as the California Standards Test were more important than common formative assessments; whereas 23.1% felt that running records were more important. A third grade teacher who favored California Standards Tests spoke about the importance of this type of data at the beginning of the school year:

I use the standardized test at the beginning of the year and I focus on what proficiency level they (students) placed at. Were they proficient? Basic? Below Basic? Far Below Basic? If they were basic, how close or how many points are they to becoming proficient based on the scaled scores. I can easily identify what standard they were weak in and then see what my next steps are.

Theme Two: Creating S.M.A.R.T. Goals in Literacy Became the Process for How Participants Aligned Literacy Assessments with Instruction

Based on the findings for Research Question 1 and Research Question 2, there is no denying that the data suggest that participants' decision making focuses on alignment. To further describe this relationship between assessments and classroom instruction, qualitative data from the videotaped grade level data team meetings were analyzed to identify patterns and themes with regards to exactly how teachers align assessments with classroom instruction.

The purpose of the videotaped grade level data team meetings was to obtain a rich, in-depth experiential account of how grade level teams analyze data in literacy. Since all 27 participants for this study were involved in Professional Learning Communities and met one day a week for one hour, participants were videotaped on one occasion with their grade level during a data analysis meeting. The videotapings took place in the fall and coincided with the 2009-2010 California standardized testing data. Both grades one, three, and five had similar objectives for the first data team meeting of the year – use standardized testing data in English Language to establish six-week S.M.A.R.T. goals in literacy. S.M.A.R.T goals are a systematic process used in professional learning communities to establish goals for teaching and learning. S.M.A.R.T. goals guide decisions about assessment data by focusing on Strategic, Measureable, Attainable, Relevant, and Time bound goals for student achievement (DuFour et al., 2006).

The data from the videotaped data team meetings revealed a systematic process of creating S.M.A.R.T. goals that described how teachers align their curriculum, literacy instruction, and assessments. It was evident from the data that participants from grades one, three and five shared similar behaviors or steps in *how* they aligned their curriculum, literacy instruction, and assessments. Figure 8 summarizes the process. An analysis of the process indicated that all participants' behaviors involved identifying a useful data source in literacy, analyzing the data by identifying areas of strength and weaknesses in student literacy performance, selecting an area of need as a goal, determining instructional practices related to an area of weakness (intended to be taught for six weeks), and creating pre-post assessments to measure the current reality for that particular area of weakness and monitor

Figure 8. The “Alignment Process” through S.M.A.R.T. goals.

student progress after the six weeks of intentional teaching. Thus, pre and post common formative assessments became a part of this process.

The qualitative data from these videotaped data team meetings also confirmed earlier findings reported in Research Question 1 that concluded that a common theme emerged as teachers shared common beliefs about the role of data in teaching. These similar findings continue to suggest that teacher beliefs do play a significant role in data-driven decision making and instructional decision making. The following descriptions from each of the data team meetings illustrate this significant finding with grade one reiterating the importance of the use of data and grades three and five and describing the importance of standardized testing and aligning their instruction to standardized tests.

During the first grade data team meeting, consisting of five teachers, the objective was to create their first S.M.A.R.T. (Strategic, Measureable, Attainable, Relevant, and Time bound goals for student achievement) goal in English language arts using the previous year’s first grade District Literacy Benchmark for the first reporting period. Since first grade is exempt from standardized testing, the data source available to first grade is limited to the district’s summative assessment. The group began with a discussion of the importance of being a reflective practitioner with strategic, measurable, attainable, realistic and relevant, timely data. The following exchange demonstrates how the group initiated the conversation about data. A participant appealed to her colleagues by saying,

Because you know that things change daily, weekly, monthly, and that constant assessment and letting that data and assessment drive the instruction is what you do and that was the part that we had missed last year. We got so much better at it though. And if you look at that difference last year using S.M.A.R.T goals compared to the previous year, that's one of the reasons that we made it out of program improvement and made those gains because we kept looking at the data all the time.

She then proceeded to provide an analogy for the importance of looking at data all the time, throughout the year.

It's that conflict. I think it's like your checkbook. You look at your checkbook all the time. You don't wait until the end of the year when it's time to do taxes and find out, whoa, we're in trouble. You constantly look at it (data) and you adjust to what's happening.

Another first grade teacher added, "And that's the purpose of the S.M.A.R.T goal because that's what we say. They didn't learn it. So as a team, what are we going to do now that's going to be different or more of in order to get into learning?"

During the third grade data team meeting, consisting of five teachers, the group used the school's data protocol or established set of guidelines or rules for looking at data and began with a discussion of the California Standards testing data from the state. They then proceeded to compare their grade level's average proficiency to the district's level in order to determine areas of success and areas of weakness and took into consideration the state's California Standards Test (CST) Blueprint to identify items most heavily-weighted on the CST. The CST Blueprint is a testing document released by the California Department of Education that itemizes each standard and indicates total test items and percentage weight on the English language arts portion of the CST (California Department of Education, 2008).

The following exchange demonstrates how the group initiated the conversation about data.

"So our protocol should really only take 60 minutes...In terms of looking at our data, the protocol says to take a look at a set of data and then identify areas where most students did well. So, we're going to really focus on the successes that we see with the data. It makes sense to first take a look at grade-level data and then we can drill down by class. But just take a look at your summary sheet, which is a cluster report."

"71% so that's certainly a bit of a success. So, literary response."

"And analysis huh? And I'm going to say this off the top of my head, but that appears to me to be the hardest one."

"And that's like eight questions. So it's 12% of the ELA (English Language Arts), and these are the types of questions or skills that students were asked to do. This

is the blueprint if you want to take a look at it. So they were asked to distinguish common forms of literature like fiction, nonfiction, comprehend basic plots of classic fairytales, mixed folktales, fables, determine what characters are like by what they say or do, so a character analysis, and determine the underlying theme or author's message."

"If you look at reading comprehension, it's at 66.6%. The district was only 71.7%."

During the fifth grade data team meeting, consisting of four teachers, the group proceeded to also use the school's data protocol or established guidelines and rules for looking at data until a teacher, new to the school site this year, interrupted the grade level facilitator and asked, "Really quick, could you just tell me the difference between a power standard and a standard?" The following exchanges describe the use of power standards for identifying what is most essential to teach students.

"We call them essential standards...what they did is they looked at all the standards and actually Marzano (2001) did some research. It would take 23 years to get through K-12 standards. So what districts and gurus say to do is what standards are leveraged? What standards are the most important standards?"

"OK. So it's the most important things that they're tested on?"

"Not necessarily tested on."

"Or that they need to leave with?"

"Yes."

Three criteria to make it a power standard. One high leverage, the one that's heavily weighted on most standardized tests will help in other content areas and then there's endurance. So what are those standards that will help our students be successfully when they leave school? Then there's readiness for the next level of learning.

During their data analysis of the state's standardized testing data, they repeatedly referred to the CST Blueprint to determine "high leverage" standards or standards that are heavily assessed on the test by comparing weights and percentages on the CST English language arts standardized test. A participant stated,

So take a look at your blueprint and if you actually go to the actual standard for writing strategies, that's on page 17. You can see how it says total number of items, there's 16 items just on writing strategies. That's 21% of the English language arts CST test.

Findings indicated that participants shared similar behaviors when using literacy data to make instructional decisions in literacy. All participants exhibited the use of a systematic process by creating S.M.A.R.T. goals. This process further describes and confirms earlier

findings of teachers needing to align their curriculum, literacy instruction, and assessments. Moreover, the descriptions of participants' use of a systematic process during their grade-level data team meeting suggest that teachers do indeed use the school's "data protocol" or established set of guidelines for looking at data as noted earlier in the chapter.

Theme Three: Participants Agreed that Certain Characteristics Make Assessment Use Straightforward and Meaningful

During the session one structured interviews, the six participants were asked to choose a literacy data source (or report) that they found most useful, and were then asked to provide a verbal account as they analyzed their selection. A District Literacy Benchmark Classroom Performance Level Summary Report, a Houghton Mifflin Summative Report from the California State Adopted English language arts program, and a Fountas and Pinnell Instructional Reading Level Report were the three assessment choices. While the data showed differences in the types of reports selected among the participants, the data revealed similar characteristics among the selected assessment reports. It is these characteristics that make assessment use straightforward and meaningful to teachers. Out of the six participants, two primary grade teachers selected the Fountas and Pinnell Instructional Reading Level Report and four upper grade teachers selected the District Literacy Benchmark Report. None of the participants selected the California State Adopted English language arts program assessment (Houghton Mifflin Assessment).

An explanation for this omission of the Houghton Mifflin Summative Assessment could be attributed to the fact that, while the school was mandated by the state to use the curriculum program, the school had flexibility in using additional resources for their English Language Arts instruction. As a result, participants did not utilize the Houghton Mifflin language arts program to fidelity. They perceived it as just a resource and not their core curriculum. It has already been established from Research Question 1 and from findings reported in this section that participants believe that curriculum, instruction, and assessments should be aligned. Therefore, it would make sense that participants would not select the Houghton Mifflin Assessment to analyze since it did not align directly with their curriculum and instruction.

The following highlights participants' reasons for their selection:

A third grade teacher, who selected the District Literacy Benchmark described how aligned the information was with the California English language arts standards. She concluded, “It’s heavily-weighted. I mean it’s a lot like the CST (California Standards Test) and it’s also broken down into the standards so that we can really focus on what exact piece that they may be needing instruction on.”

A fifth grade teacher, who also selected the District Literacy Benchmark, agreed. She described the information on this report as being more specific compared to the others:

It is the most specific and it’s related to the standards and when I look at the numbers, I know exactly what that’s talking about. I like the way it breaks them up but it also gives you the bulk of the Word Analysis. You see the color-coding; you see the percents, very specific.

On the other hand, another fifth grade teacher, who selected the Fountas and Pinnell Reading Level Report, expressed her frustration with the overemphasis on the standards. She insisted,

I think these tests (Fountas and Pinnell Reading Level Report) are catered to the needs of the child as opposed to these standardized tests that are, it’s just the same thing given to everybody. Like this is more their instructional reading level, it gives me ideas of what I can be working on with them in words not in numbers. Not having to refer back to another standard.

A first grade teacher added,

The easiest right away for me is the Fountas and Pinnell. Well I can look at the next steps and I’m very familiar with reading levels. So as soon as I see a level N or whatever the particular level is I know what that means as a reader. Whereas when I look at the Houghton Mifflin then it’s more percentile based and it’s not as friendly. It is readable but it takes more time, this is faster for me.

Of the six participants, two participants expressed the need for using multiple measures or more than one assessment. A first grade teacher expressed, “I think they are all equally valuable but it depends on what I want to plan and target. So if I were thinking about reading, I would want to use the reading level report and go from there.” Similarly, a third grade teacher took the time during the interview to describe a sequence for how she would utilize the District Literacy Benchmark Report and the Fountas and Pinnell Reading Level Report as multiple measures of data. Her description included first looking at a single data source and then examining the information from that data source. Next, looking at the second data source, and examining the information from that data source. Then she described comparing and contrasting the information on both reports to finally make generalizations about students and recommendations for instruction.

I think I would first use the benchmark report to see what their strengths are, what their needs were and then look at the Fountas and Pinnell Reading Level Report and line up the instructional strategies that they need with the standards. If on the benchmark, literacy analysis and anything to do with character development was a weakness, then I would go to the Fountas & Pinnell Reading Level Report and say they need to use dialogue so I would teach that strategy to improve their literary analysis standard.

Participants' responses during these interviews revealed the following common characteristics that make assessment use straightforward and meaningful (see Table 15):

- Characteristic 1: The purpose of administering the assessment
- Characteristic 2: Familiarity with the assessment information provided
- Characteristic 3: How the data is presented or laid out to teachers (format)
- Characteristic 4: Depth and complexity of analysis offered on the report

The selection of the Fountas and Pinnell Instructional Reading Level report reaffirms participants' earlier beliefs that running records are an important assessment to teachers. Quantitative findings reported earlier in this section (for Research Question 2) found that 50% of the participants reported that running records were important. The Fountas and Pinnell Instructional Reading Level report provides teachers with the same information as a running record (students' independent and instructional reading levels) but differs in that the report identifies specific reading behaviors, strategies, or skills that students' have difficulty with in their reading.

Participants were encouraged to provide an example of a small group lesson that they might do as a result of the data report they selected. All six participants discussed identifying students with similar instructional needs, whether a reading strategy or skill, and then forming small, homogenous "strategy or skill groups" to provide instructional intervention for a short period of time. A first grade teacher who selected the Fountas and Pinnell Instructional Reading Level Report explained,

I would look at the strategies that each targeted group is missing so I would see if there were three or four children who are missing a certain strategy like understanding that dialogue adds to character development. If I have four, a group of students that still need that strategy, then I would group them per the strategy. I would use the same text with all of them. But I'm looking at the strategies first.

Table 15. Common Characteristics Important to Teachers when Analyzing Literacy Data Reports

Fountas and Pinnell Instructional Reading Level Data Report			
Purpose of Administering Assessment	Familiarity with Assessment Information	Display of Data on Report (format)	Depth of Analysis of Data (drill-down capabilities)
To assess students' reading level and ability	More user-friendly Class listing displayed in three columns (student name, instructional reading level, strategies, behaviors for particular reading level)	More familiar with instructional reading levels, strategies and reading behaviors	Provides specific strategies or reading behaviors based on Fountas and Pinnell instructional reading level Specialized to individual needs
District Literacy Benchmark Report			
Purpose of Administering Assessment	Familiarity with Assessment Information	Display of Data on Report (format)	Depth of Analysis of Data (drill-down capabilities)
To assess concepts related to each standard	More familiar with English Language Arts Standards	Items and Questions aligned to CST Standardized or norm-referenced	Provides item analysis based on grade level English Language Arts standards in Word Analysis, Reading Comprehension, Literary Analysis

A third grade teacher who selected the District Literacy Benchmark Report reported,

OK so this is reading 3.1 where a lot of the, well there's a big group of kids here (pointing to the data report), who only scored 50%. OK, so there's eight kids, that would be a small group and that's showing that that's where they need instruction on that standard (pointing to the 3.1 standard on the data report). The lesson then would be the elements, the story elements, the plot, setting, characters in the story, the beginning, the middle, and the ending. I would use Houghton Mifflin and Standards Plus. There are groups of lessons on this too with assessments.

These descriptions of instructional decision making as a result of the data report selected confirm participants' previous perceptions about themselves for Research Question

1 that found that teachers see themselves intuitive statisticians with the ability to use various instructional techniques or strategies at their disposal to improve student achievement. The interview data illustrates participants' ability to identify instructional interventions for students. One can then argue that despite not having formal training in assessment or literacy assessments, teachers possess the ability to make instructional recommendations in literacy based on data. This supposition leads to the next section of research question 2 that explores the central question of, "How do teachers make data-driven instructional decisions in literacy?"

Research Question 2b: How Do Teachers Determine Interventions for a Group of Students and Individual Students Based on Data?

To narrow the focus of the central research question that asked, "How do teachers make data-driven instructional decisions in literacy?" this sub-question provides a narrower focus of the study, by examining how the 27 teachers determine interventions for a group of students and individual students using literacy data. Survey and interview data were analyzed. The quantitative analysis indicated information about how teachers identify students with common areas of skill needs in literacy for a group of students and for individual students, compare pre and post test data and steer clear of disaggregating data. The qualitative analysis confirmed the results indicated from the quantitative data by further describing how teachers compare student performance, identify gaps in learning, group students for intervention, while further revealing how important it is to reflect on their own instructional practice.

QUANTITATIVE DATA

The 27 participants were surveyed to determine the method(s) used to analyze data and the frequency of data analysis performed on state standardized literacy data, district benchmark data, instructional reading level data, and grade-level teacher created assessment (common formative assessments) data for a group of students and for an individual student.

Determining Interventions for a Group of Students

Respondents were asked about the following methods of data analysis for a group of students:

- Examining the class average
- Doing an item analysis to identify strongest and weakest areas of California Reading/Language Arts standards
- Looking at the range of scores
- Looking at overall literacy performance disaggregated by Adequate Yearly Progress (AYP) subgroups as determined by the state
- Looking at overall literacy performance disaggregated by performance level such as Advanced Proficient, Basic, Below Basic, Far Below Basic
- Looking at overall literacy performance disaggregated by CA Reading/Language Arts standards (Reading Comprehension, Response to Literature, Word Analysis, Written Conventions, and Writing Strategies)
- Identifying students with common areas of skill needs in literacy
- Looking at overall reading performance aggregated by targeted reading goals, grade level expectations or benchmarks.

Identifying Students with Common Areas of Skill Needs in Literacy

Results from the survey indicated similar findings with participants most frequently reporting using the method of identifying students with common areas of skill needs in literacy when analyzing state standardized literacy data, district literacy benchmark data, instructional reading level data, and grade-level common assessment data for a group of students. 73.1 percent of the participants reported using this method of analysis on at least a weekly or monthly basis for state standardized literacy data, 66.7% on at least a weekly or monthly basis for district literacy benchmark data, 80.7% on at least a weekly or monthly basis for instructional reading level data, and 88.5% on at least a weekly or monthly basis for grade-level created assessments (common formative assessments) (see Table 16).

State standardized data. As seen in the frequency distribution in Table 16, doing an item analysis to identify strongest and weakest areas of CA Reading/Language Arts standards is the most frequent method of analyzing data with 50% using this approach at least on a monthly basis. Conversely, the least frequent method of analyzing state standardized data

Table 16. Responses to “How Often Do You Use the Following Methods to Analyze State Standardized Literacy Data for a GROUP of Students?”

N = 27	At least weekly %	At least monthly %	At least quarterly (every 9 weeks) %	Annually %	Never %
Examine the class average ^a	7.7	30.8	26.9	23.1	11.5
Do an item analysis to identify strongest and weakest areas of CA Reading/Language Arts standards ^a	3.8	46.2	19.2	19.2	11.5
Look at the range of scores ^a	3.8	38.5	30.8	23.1	3.8
Look at overall literacy performance disaggregated by AYP subgroups ^a	3.8	15.4	38.5	26.9	15.4
Look at overall literacy performance disaggregated by performance level such as Advanced, Proficient, Basic, Below Basic, Far Below Basic ^a	3.8	34.6	34.6	19.2	7.7
Look at overall literacy performance disaggregated by CA Reading/Language Arts standards (Reading Comprehension, Response to Literature, Word Analysis, Written Conventions, Writing Strategies) ^a	3.8	30.8	34.6	19.2	11.5
Identify students with common areas of skill needs in literacy ^a	30.8	42.3	7.7	15.4	3.8

^a Contained missing data.

was looking at overall literacy performance disaggregated by AYP subgroups with 80.8% reporting at least quarterly, annually, or never. With the increased pressure from state accountability to increase academic achievement for a school's significant subgroups by 10% each year, it is surprising that this method of analysis, disaggregating the data by AYP subgroups, was the least frequent method of analyzing data.

On the other hand, the disaggregation of assessment data by performance levels and standards showed similar distributions, along with the same percentages for frequency in how often they used such approaches. Results indicated 69.2% using the method of looking at overall literacy performance disaggregated by performance level such as Advanced, Proficient, Basic, Below Basic and Far Below Basic on at least a quarterly basis. Disaggregating data by performance level rather than by AYP subgroups further indicates that teachers did not pay particular attention to subgroup data as one would predict.

District benchmark data. As seen in the frequency distribution in Table 17, the first three columns show that while only 4% examine the class average annually for district benchmark data, at least 88% did so at least quarterly. This shows that teachers were using the data regularly. Since the district literacy benchmark data are administered quarterly, similar trends were revealed for each method of analysis; respondents reported using all types of methods except for identifying students with common areas of skill needs in literacy at least quarterly. Sixty-six percent reported the use of identifying students with common areas of skill needs in literacy at least monthly.

Contrary to the findings of the use of disaggregating data with state standardized data, particularly the use of disaggregating AYP subgroup data, results for the district literacy benchmark data show that 76.8% reported using this method at least quarterly. Furthermore, 80% reported disaggregating the data by performance level such as Advanced, Proficient, Basic, Below Basic, and Far Below Basic at least quarterly.

Instructional reading level data. As seen in the frequency distribution in Table 18, results indicated that half of the respondents looked at the range of scores, overall reading performance aggregated by targeted reading goals or benchmarks, and identified students

Table 17. Responses to “How Often Do You Use the Following Methods to Analyze District Literacy Benchmark Data for a GROUP of Students?”

N = 27	At least weekly %	At least monthly %	At least quarterly (every 9 weeks) %	Annually %	Never %
Examine the class average ^a	4.0	20.0	64.0	4.0	8.0
Do an item analysis to identify strongest and weakest areas of CA Reading/Language Arts standards ^a	11.5	23.1	50.0	7.7	7.7
Look at the range of scores ^a	12.0	16.0	56.0	8.0	8.0
Look at overall literacy performance disaggregated by AYP subgroups ^a	3.8	11.5	61.5	11.5	11.5
Look at overall literacy performance disaggregated by performance level such as Advanced, Proficient, Basic, Below Basic, Far Below Basic ^a	4.0	24.0	52.0	12.0	8.0
Look at overall literacy performance disaggregated by CA Reading/Language Arts standards (Reading Comprehension, Response to Literature, Word Analysis, Written Conventions, Writing Strategies) ^a	4.0	24.0	48.0	12.0	12.0
Identify students with common areas of skill needs in literacy ^a	16.7	50.0	25.0	8.3	0.0

^a Contained missing data.

Table 18. Responses to “How Often Do You Use the Following Methods to Analyze Instructional Reading Level Data for a GROUP of Students?”

N = 27	At least weekly %	At least monthly %	At least quarterly (every 9 weeks) %	Annually %	Never %
Look at the range of scores	0.0	51.9	29.6	11.1	7.4
Look at overall reading performance disaggregated by AYP subgroups ^a	0.0	28.0	36.0	16.0	20.0
Look at overall reading performance aggregated by targeted reading goals or benchmarks ^a	3.8	50.0	26.9	15.4	3.8
Identify students with common areas of skill needs in reading ^a	26.9	53.8	11.5	7.7	0.0

^a Contained missing data.

with common areas of skill needs in reading at least monthly. 27% identified students with common areas of skill needs in literacy at least weekly, with 80.7% doing it at least monthly. Similar to the findings of the use of disaggregating data with state standardized data, particularly the use of disaggregating AYP subgroup data, results for instructional reading level data show 72% reported doing this at least quarterly, annually or never.

Common formative assessment data. To further examine the extent to which teachers analyze grade-level created assessments (common formative assessments), survey items measured how often respondents used various methods of data analysis for a group of students. Since common formative assessments are administered more frequently and are meant to inform classroom instruction, it wasn't surprising that the findings revealed that respondents used all types of methods of analysis *at least* monthly.

Of those who reported doing so at least monthly (see Table 19), 85% examined the class average; 77% did an item analysis to identify strongest and weakest areas of CA Reading/Language Arts standards; 73% looked at the range of scores; 44% looked at overall literacy performance disaggregated by AYP subgroups, 73% looked at overall literacy

Table 19. Responses to “How Often Do You Use the Following Methods to Analyze Grade Level Created Literacy Assessment Data (Common Formative Assessments) for a GROUP of Students?”

N = 27	At least weekly %	At least monthly %	At least quarterly (every 9 weeks) %	Annually %	Never %
Examine the class average ^a	7.7	76.9	7.7	3.8	3.8
Do an item analysis to identify strongest and weakest areas of CA Reading/Language Arts standards ^a	3.8	73.1	11.5	3.8	7.7
Look at the range of scores ^a	7.7	65.4	15.4	7.7	3.8
Look at overall literacy performance disaggregated by AYP subgroups ^a	4.0	40.0	16.0	16.0	24.0
Look at overall literacy performance disaggregated by performance level such as Advanced, Proficient, Basic, Below Basic, Far Below Basic ^a	3.8	69.2	11.5	7.7	7.7
Look at overall literacy performance disaggregated by CA Reading/Language Arts standards (Reading Comprehension, Response to Literature, Word Analysis, Written Conventions, Writing Strategies) ^a	3.8	61.5	19.2	7.7	7.7
Identify students with common areas of skill needs in literacy ^a	23.1	65.4	3.8	7.7	0.0

^a Contained missing data.

performance disaggregated by performance level such as Advanced, Proficient, Basic, Below Basic, and Far Below Basic; 65% looked at overall literacy performance disaggregated by CA Reading/Language Arts standards; 89% identified students with common areas of skill needs in literacy. Regrouping students based on common areas of skill needs was done on a regularly basis.

With regards to disaggregating by AYP subgroups, results for common formative assessments show that 60% reported doing it at least quarterly. As a result of standards-based accountability policies that put pressure on low-achieving schools to meet a series of annual academic performance goals or Adequate Yearly Progress (AYP) for numerically significant subgroups, it is not surprising that participants used this method of data analysis more frequently. Together with the use of common formative assessments, it appears participants' common beliefs about the role of data in teaching indeed influences how they analyze data.

One can conclude that because participants perceived common formative assessments as extremely important (as reported for Research Question 1) and value this type of assessment, it would make sense for them to use more methods of data analysis with this type of assessment over standardized tests, district literacy benchmarks, and instructional reading level data.

Individual data. Respondents were asked about the following methods of data analysis or different ways of analyzing data for individual students:

- Looking at overall literacy performance disaggregated by CA Reading/Language Arts standards
- Looking at overall literacy performance disaggregated by performance level such as Advanced Proficient, Basic, Below Basic, Far Below Basic
- Looking at student literacy scores question by question (item analysis)
- Looking at overall reading performance and comparing against targeted reading goals or benchmarks
- Comparing pre-and post-test data
- Looking at miscue data for patterns
- Looking at fluency data and comparing against grade level fluency norms
- Looking at reading comprehension scores or skills (inferential or literal understanding)

- Looking at retelling data

Results from the survey indicated comparing looking at reading comprehension scores or skills (inferential or literal understanding) as the most frequent method of analysis with 73% of teachers reporting doing so at least monthly. The next most frequent method of analysis was to look at overall student literacy performance disaggregated by CA Reading/Language Arts standards with 70% reporting doing so at least monthly. Table 20 shows the frequency distribution for these findings.

The following methods for individual analysis were reported being used at least monthly: looking at overall student literacy performance disaggregated by CA Reading/Language Arts standards (70%), looking at overall literacy performance disaggregated by performance level such as Advanced, Proficient, Basic, Below Basic, Far Below Basic (69%), looking at student literacy scores question by question (item analysis) (62%), comparing reading performance by comparing against targeted reading goals, grade level expectations or benchmarks (69%), comparing pre-post test data (69%), looking at miscue data for patterns (58%), looking at fluency data and compare against grade level fluency norms (52%), looking at reading comprehension scores or skills (73%), and looking at retelling data (62%). This indicates that a large number of teachers at the school use various data analysis frequently.

Quantitative Analysis Summary for Research Question 2b

The results of this statistical analysis served as one measure in investigating the methods used by elementary teachers to determine interventions for a group of students and individual students. In summary, quantitative results indicated that when teachers look at data, teachers identified students with common areas of skill needs in literacy at least monthly, compare pre-post test data at least monthly, and disaggregate assessment data frequently.

QUALITATIVE DATA FOR RESEARCH QUESTION 2B

To further describe how teachers determine interventions for a group of students and for individual students, qualitative data from the structured interviews were analyzed to

Table 20. Responses to “How Often Do You Use the Following Methods to Analyze Literacy Data for INDIVIDUAL Students?”

N = 27	At least weekly %	At least monthly %	At least quarterly (every 9 weeks) %	Annually %	Never %
Look at overall student literacy performance disaggregated by CA Reading/Language Arts Standards	18.5	51.9	14.8	14.8	0.0
Look at overall literacy performance disaggregated by performance level such as Advanced, Proficient, Basic, Below Basic, Far Below Basic ^a	15.4	53.8	15.4	15.4	0.0
Look at student literacy scores question by question (item analysis) ^a	19.2	42.3	19.2	15.4	3.8
Look at overall reading performance and compare against targeted reading goals or benchmarks ^a	19.2	50.0	19.2	11.5	0.0
Compare pre-and post-test data ^a	3.8	65.4	26.9	3.8	0.0
Look at miscue data for patterns ^a	19.2	38.5	23.1	11.5	7.7
Look at fluency data and compare against grade level fluency norms ^a	8.0	44.0	28.0	8.0	12.0
Look at reading comprehension scores or skills (inferential or literal understanding) ^a	11.5	61.5	7.7	15.4	3.8
Look at retelling data ^a	11.5	50.0	26.9	11.5	0.0

^a Contained missing data.

further identify patterns and themes associated how teachers identify interventions for students.

Theme: Teachers' Perceived Themselves as Problem Solvers and Decision Makers when It Came to Struggling Students

Interview session one was meant to capture how teachers analyzed data for a group of students and how they determined interventions based on the data. The six participants were asked to give an example of how literacy data had been used in their classrooms for a group of students. All participants proceeded to discuss the data sources they used in their classrooms for a group of students. All participants reported the use of the following data sources: district literacy benchmark data, reading fluency data, Fountas and Pinnell instructional reading level data, and common formative assessments such as pre-post test data for grade level created S.M.A.R.T. (Strategic, Measureable, Attainable, Relevant, and Time bound goals for student achievement) goals and “power standards” or standards most heavily weighted on standardized tests.

Methods of Data Analysis

Similar patterns emerged as participants discussed the methods they used when analyzing the different data sources for a group of students to determine appropriate instructional interventions. Their responses can be grouped into the following categories of instructional decision making: comparing how students are progressing in their learning, identifying gaps in student learning, grouping students for intervention, and informing instructional practices. As participants described their instructional decision making, it became clear that teachers saw themselves as problem solvers and decision makers with the ability to compare students, identify gaps, group students, and inform their own practice. This finding is consistent with findings for Research Question 1 that revealed that teachers saw themselves as intuitive statisticians.

Category 1: Comparing how students are progressing in their learning. Both a first and a third grade teacher determined whether students met proficiency or not by comparing students' test scores to scaled scores or predetermined performance bands such as Advanced, Proficient, Basic, Below Basic, and Far Below Basic. Such scaled scores or

predetermined bands of scores function in the same manner as state standardized tests that assign a performance level to students based on their total score or performance on particular assessment. The first grade teacher explained, “How did they do as a whole, how many kids were proficient and basic and see what their needs are. Then I break down the kids to small groups and use that data to hone in and see exactly what strategies or standards they’re missing.” The third grade teacher explained, “I’m looking at district literacy benchmarks and looking at the proficiency levels. You know as far as what they’re not getting, that’s our next steps for guiding the instruction.”

Category 2: Identifying gaps in student learning. Five of the participants discussed identifying gaps or weaknesses in student learning and using these gaps to form homogeneous groups to provide small group instruction or intervention for students. For example, a first grade teacher explained, “As soon as I look at the information, I say, ‘Oh, there’s a gap there or oh, there’s a strength there.’ And so as per whatever that gap or strength is I’m going to make the adjustment.”

Category 3: Grouping students for intervention. A first grade teacher described using a formative assessment to group students for word study intervention. She stated,

I use the Developmental Spelling Analysis to start the year and one of the things I do with that is to look at what their gaps are. Like say they’re missing affricates or consonant blends and so that helps me to form my word study groups right away. And that doesn’t stay the same for very long, they’re constantly changing.

A fifth grade teacher described using Fountas and Pinnell instructional reading levels. “That helped me place them into like guided reading groups or literature circles.”

Category 4: Informing instructional practices. All participants concurred that in order to help students achieve, changes need to be made with their own teaching. All participants implied that the use of data forces them to reflect on their own teaching – their instructional practice – to adjust, change, prioritize, or enhance instruction. This was reported in several ways. For example, one teacher noted changing a teaching technique or way of presenting the material. Another reported changing the grouping arrangement. And another reported increasing instructional time. A third grade teacher reported,

So, we did a SMART goal for synonyms and antonyms and created pre-post assessments. And the way we taught it wasn’t very successful because we looked

at the data before and we looked at the data after and it wasn't very successful. So then, on my own, I thought about what we need and then created like two weeks of a unit meant to build vocabulary because when I analyzed the data it wasn't that they didn't understand what a synonym or and what an antonym was but they didn't have enough vocabulary to be able to identify synonyms or antonyms for words, they didn't have the skills to understand how to figure out meaning and context.

Moreover, a fifth grade teacher explained, "If I notice that in the data, a few particular kids need to be in a group because of what the data says. Maybe they don't recognize fact and opinion and I might pull just a small group and do something like that with them."

Another fifth grade teacher reported a change in her scope and sequence or pacing of instruction for their unit on fiction:

Right now with our standard for reading, when we gave the pre-test, the group I have did excellent on all the literal questions. And so instead of spending more time on the surface levels of theme and character motivation, I knew that right away we had to go deeper and get to the inferential. So the assessment showed me that my group that I have right now can do that off the bat and so then we needed to get deeper into analyzing character and how it leads to the theme.

Research Question 2c: What Kinds of Interventions Do Teachers Identify?

The survey and interviews were used to answer this sub research question. The quantitative analysis indicated changes in instruction made by teachers for a group of students and for individual students. Furthermore, findings revealed that teachers favored scaffolding instruction and direct, explicit instruction as the most likely change. The qualitative analysis explored the results indicated from the quantitative data by revealing participants' instructional decision making

QUANTITATIVE DATA

Part Three of the survey required teachers to identify changes made to their instructional practice for a group of students based on literacy data. Respondents were provided with a list of the school's research-based instructional strategies and required to indicate Yes or No from the list of possible changes.

Changes in Instruction for a Group

Findings revealed that all respondents made changes to instructional practice based on student literacy assessment data. The total percentage for each change is presented in Table 21. The highest reported change was scaffold instruction (100.0%), and the least reported change was increase the use of read alouds (81.5%). Increasing the use of shared reading (81.5%), and increasing more opportunities for independent practice with literacy skills or strategies previously taught were also among the least reported change with 84.6% reporting yes. Similar percentages were reported for providing more direct, explicit instruction for a specific literacy strategy or skill (96.3%); changing the pace of future literacy instruction (96.3%); differentiating instruction based on student strengths and areas of need to provide intervention or enrichment (96.3%). These high percentages indicate an awareness to a change of instructional practice.

Changes in Instruction for Individual Students

Similar findings were revealed when participants were asked about changes in instruction for individual students. All respondents made changes to instructional practice based on student literacy assessment data. The total percentage for each change is presented in Table 22. Similar percentages were reported for the highest reported change-provide more direct, explicit instruction for a specific literacy strategy or skill (92.3%); regroup students within the classroom for specific literacy skills or strategy instruction (92.3%); use graphic organizers to support literacy instruction (92.3%); provide students with leveled books appropriate to students' instructional or independent reading level (92.3%). Similar percentages were also reported for the least reported changes-provide timely, specific feedback related to specific literacy skills or strategies (84.6%); provide more small group instruction (84.6%); increase more opportunities for independent practice with literacy skills or strategies previously taught (84.6%). Again, the data indicate high percentages for change and awareness to a change of instructional practice.

Table 21. Changes Made to Instructional Practice for a Group Based on Student Literacy Assessment Data

N = 27	Yes %	No %
Provide more direct, explicit instruction for a specific literacy strategy or skill	96.3	3.7
Change the pacing of future literacy instruction	96.3	3.7
Regroup students within the classroom for specific literacy skills or strategy instruction	92.6	7.4
Regroup students within the grade level for specific literacy skills or strategy instruction	92.6	7.4
Differentiate instruction based on student strengths and areas of need to provide intervention or enrichment	96.3	3.7
Scaffold instruction	100.0	0.0
Provide more guided practice with specific literacy skills or strategies	92.6	7.4
Provide timely, specific feedback related to specific literacy skills or strategies ^a	88.5	11.5
Use graphic organizers to support literacy instruction	85.2	14.8
Build background knowledge to frontload literacy instruction	92.6	7.4
Provide students with leveled books appropriate to students' instructional or independent reading level	92.6	7.4
Increase the use of shared reading	85.2	14.8
Increase the use of read aloud	81.5	18.5
Increase more opportunities for independent practice with literacy skills or strategies previously taught ^a	84.6	15.4

^a Contained missing data.

Table 22. Changes Made to Instructional Practice for Individual Students Based on Student Literacy Assessment Data

N = 27	Yes %	No %
Provide more direct, explicit instruction for a specific literacy strategy or skill	92.3	7.7
Change the pacing of future literacy instruction	88.5	11.5
Regroup students within the classroom for specific literacy skills or strategy instruction	92.3	7.7
Regroup students within the grade level for specific literacy skills or strategy instruction	88.5	11.5
Differentiate instruction based on student strengths and areas of need to provide intervention or enrichment	88.5	11.5
Scaffold instruction	88.0	12.0
Provide more guided practice with specific literacy skills or strategies	88.5	11.5
Provide timely, specific feedback related to specific literacy skills or strategies	84.6	15.4
Use graphic organizers to support literacy instruction	92.3	7.7
Build background knowledge to frontload literacy instruction	88.5	11.5
Provide students with leveled books appropriate to students' instructional or independent reading level	92.3	7.7
Provide more small group instruction	84.6	15.4
Increase more opportunities for independent practice with literacy skills or strategies previously taught	84.6	15.4

QUANTITATIVE ANALYSIS SUMMARY FOR RESEARCH QUESTION 2C

A summary of the survey data regarding how teachers respond to students with gaps in their learning revealed similar findings. The most consistent change in instruction reported for both a group of students and individual students would be to provide more

direct, explicit instruction for a specific literacy strategy or skill, and that the most unlikely change in instruction would be to increase more opportunities for independent practice.

QUALITATIVE DATA FOR RESEARCH QUESTION 2C

These findings can be further supported in the qualitative data from the survey (Part 5), which included two student scenarios describing typical struggling readers (one of a primary grade student, the other of an upper grade student) with an open-ended question that asked teachers to recommend instructional interventions for helping each struggling reader, along with the interview data that asked teachers to provide an example of how literacy data had been used in their classrooms for a group of students and to tell about a time when their instruction changed as a result of literacy assessment data.

THEME ONE: PRIMARY GRADE TEACHERS IDENTIFIED GENERAL STRATEGIES FOR INTERVENTION, WHILE UPPER GRADE TEACHERS IDENTIFIED SPECIFIC STRATEGIES FOR READING COMPREHENSION AND VOCABULARY

Both the interview and survey data revealed that participants considered the district's Three-Tier Response to Intervention and Instruction (RTI²) model that outlines interventions for each tier. According to the district's RTI² model, RTI² calls for increasingly more intense tiers of support that are differentiated in both nature and duration for students who need it. When Tier 1 has been implemented with fidelity and students exhibit difficulty in that level, they move on to Tier 2 for more support. If students continue to exhibit difficulty in Tier 2 after effective supplemental instruction and interventions have been provided with fidelity, they move on to Tier 3 for more intensive support (San Diego Unified School District, 2009). Typical responses included the use of the district's Tier 2 phonics intervention programs, while other responses included the use of specific research-based strategies to strengthen Tier 1.

Primary Grade Scenario – Struggling Student

Of the 13 participants to the survey Part 5 who selected the primary grade scenario of Ethan, a beginning first grader who struggled with blending sounds together, three of the participants recommended the district's Tier 2 phonics reading intervention program, PALS. Six of the participants recommended direct, explicit instruction by having the teacher model how to blend words, while four participants recommended the use of shared reading as an approach to expose Ethan to blending sounds in words.

Of the three who recommended the district's Tier 2 phonics reading intervention program, a kindergarten teacher suggested, "He would need 1 on 1 or small group instruction to practice blending sounds. A PAL (Pathways to Achieving Literacy) program would be perfect." Of the six who recommended direct, explicit instruction through the use of modeling, a second grade teacher explained, "The teacher would provide direct instruction with much modeling and guided practice." Another second grade teacher added the instructional strategy of total physical response. She suggested,

I would do blending activities that involved Ethan physically blending sounds with words or connecting cubes. Something that would help him see and hear the blending together. I would also teach him to use his fingers and each sound was one finger and when you close your fingers into a fist, is when you blend all the sounds together.

Of the four who recommended the use of shared reading, one first grade teacher explained, "I would do lots of shared readings to help the child see and hear the blending sounds."

Upper Grade Scenario – Struggling Student

Of the 12 respondents who selected the upper grade scenario of Denise, a fourth grader who struggled with reading comprehension, five of the participants recommended vocabulary instruction, four of the participants recommended direct, explicit instruction in word analysis, and three of the participants recommended comprehension instruction with a focus on the inferential understanding of texts.

Of the five who recommended vocabulary instruction, a third grade teacher suggested using Marzano's (2001) research-based vocabulary instruction, "It's important that she gets a

larger vocabulary under her belt. I would work with Denise on developing her word knowledge using methods advocated by Marzano.” Of the four who recommended direct, explicit instruction in word analysis, a third grade teacher explained,

The test scores show that she is still struggling with word analysis. She would need direct and small group instruction on strands within that standard (prefix/suffix; synonym/antonym, etc.). This way as the words become longer and more difficult, she will be able to keep her reading comprehension score up and raise her word analysis score.

Of the three who recommended comprehension instruction with a focus on inferential understanding of texts, a fifth grade teacher stated,

I would work with Denise on strategies that promote inferential thinking, a skill necessary for success on the fifth grade standards test. I might give her some specific passages/texts that require her to infer to make meaning of text.

Interview session two was meant to capture how teachers adjusted their instruction as a result of literacy data. The six participants were asked to recall a time when their instruction changed as a result of literacy assessment data for a group of students. A fifth grade teacher recalled,

Right now with our power standard for reading, we talked at our PLC (Professional Learning Community), when we gave the pre-test with the questions at the literal level of CST (California Standards Test) questions, and the group that I have this year did excellent on that. And so instead of spending more time sort of going at the surface levels of theme and character motivation and that kind of thing. I knew right away that we had to go deeper and get into the inferential. Last year we had to spend awhile on still getting to what is the theme. So, the assessment showed me that group that I have right now, can do that off the bat. So then we needed to get deeper into analyzing character and how it leads to theme.

Interview session three was meant to capture how teachers used assessment data to increase student achievement. Participants were asked to describe a struggling reader whose performance improved through the use of data-driven instruction. Similar patterns emerged as all participants recalled a struggling reader from their classrooms, described the struggling reader by referring to the types of data sources used to support their judgments about students, and explained the interventions they designed for their struggling readers. Participants described the use of standards-based teaching as an intervention, along with the use of programs. A third grade teacher, who in the previous year taught fifth grade, recalled,

I will talk about Ashley (pseudonym) and she was a struggling reader. She was that kid at basic. She was that 342 kid (a student whose scaled score on the standardized test fell in between the range of 340-350. These students are often

classified as “bubble” or “cusp kids” and are typically selected for targeted intervention due to the fact that have a greater chance of scoring proficient since students need a scaled score of 350 to be considered proficient at any grade level). She was not an English language learner. We did the San Diego Quick, we did a fluency assessment with the Six Minute Solution, and as a result of the San Diego Quick, and we put her in REWARDS (a district intervention program focused on phonics) and the Six Minute Solution (a district intervention program focused on fluency). I looked at her benchmarks every time and she was always right on, just like below proficient or just above proficient. When I looked at her CST (California Standards Test) score she was, she went from basic in fourth grade to proficient in fifth grade!

Another fifth grade teacher went on to describe a struggling student,

Well my Johnny (pseudonym) he was proficient or advanced in math but in reading or literacy he was basic across the board and that was really the first year we started picking apart the data. And....the part he was the lowest in was language conventions like the technical punctuation and the word analysis, his vocabulary. So we really did a lot of work on vocabulary...and also the fifth grade standards of knowing the prefixes and roots so that he had those tools in his pocket that he could use to solve things. He ended up being proficient that year.

DATA ANALYSIS SUMMARY OF THE QUANTITATIVE AND QUALITATIVE ANALYSIS FOR RESEARCH QUESTION 2

There is no denying that, together with findings for Research Question 1 and the quantitative and qualitative data reported in this section, a significant conclusion can be made about participants and how they make data-driven instructional decisions in literacy. This conclusion has resonated throughout the findings for this study. Participants see themselves as intuitive statisticians, problem solvers, and decision makers with the ability to make data-driven instructional decisions in literacy.

The descriptions from the interviews that asked participants to describe their instructional decision making for a group of students and for individual students indicated that participants possessed the ability to use various instructional techniques or strategies at their disposal to improve student achievement for a group of students and for individual students. On the surface it seems that participants were able to articulate various instructional techniques or strategies. However, a closer look at the data reveal that teachers' interview responses offered no depth and complexity to a wider range of strategies for reading strategies.

Research Question 3. What Data-driven Decision Making Differences Exist between Primary (K-2) and Upper (3-5) Grade Teachers?

One can ask whether despite not having formal training in assessment or literacy assessments, if teachers can possess the ability to make effective instructional decisions in literacy based on data? To that end, it is essential to explore if any variability exists between primary and upper grade teachers. Are there differences in how teachers make data-driven decisions in literacy among primary (K-2) and upper (3-5) grade teachers? If so, what are those differences and how do these differences influence decision making. This issue leads into the next research question that was explored in this study.

QUANTITATIVE DATA

The survey data were used to analyze the data-driven decision making differences between primary (K-2) and upper (3-5) grade teachers. The quantitative analysis indicated the degrees of differences in the type of literacy assessments administered by grade taught, differences in choosing assessments by grade taught, and differences in the frequency of assessments administered among K-2 and 3-5 teachers.

Differences in Type of Literacy Assessments Administered by Grade Taught

Independent samples *t* tests were used to determine differences in type of literacy assessments administered by grade taught. The significant results ($p < .05$) are reported in Table 23. For types of literacy assessments administered, primary grade teachers administered word lists significantly more frequently than did upper grade teachers, $t = 2.59$, $df = 11.23$, $p = .025$. Primary grade teachers administered letter identification significantly more frequently than did upper grade teachers, $t = 2.78$, $df = 24$, $p = .011$; and primary grade teachers administered phonemic awareness significantly more frequently than did upper grade teachers, $t = 2.98$, $df = 10.58$, $p = .013$. Due to the nature of the primary grades as focused on teaching students how to read, it is not surprising that more assessments related to learning how to read such as letter identification, word lists, and phonemic awareness assessments are administered more frequently than in upper grades which tend to focus on reading to learn.

Table 23. Differences in Type of Literacy Assessments Administered by Grade Taught

Type of Literacy Assessments Administered	Grade	<i>t</i>	<i>df</i>	<i>P</i>
Word lists	K-2 3-5	2.59	11.23	.025
Letter identification	K-2 3-5	2.78	24	.011
Phonemic awareness	K-2 3-5	2.98	10.58	.013
<i>To Analyze State Standardized Literacy Data</i>				
Look at range of scores	K-2 3-5	2.05	24	.052
Identify students with common areas of skill needs in literacy	K-2 3-5	2.14	24	.043
<i>To Analyze Instructional Reading Level Data</i>				
Look at range of scores	K-2 3-5	2.15	25	.042
Identify students with common areas of skill needs in reading	K-2 3-5	1.98	24	.060
<i>To Analyze Grade Level Created Literacy Assessment Data for a Group of Students</i>				
Identify students with common areas of skill needs in literacy	K-2 3-5	1.84	24	.078
<i>To Analyze Literacy Data for Individual Students</i>				
Look at overall literacy performance disaggregated by performance level such as Advanced, Proficient, Basic, Below Basic, Far Below Basic	K-2 3-5	2.11	24	.046

(table continues)

Table 23. (continued)

Type of Literacy Assessments Administered	Grade	<i>t</i>	<i>Df</i>	<i>p</i>
<i>To Analyze Literacy Data for Individual Students</i>				
Look at retelling data	K-2 3-5	1.84	24	.079

State standardized data. For analyzing state standardized literacy data, primary grade teachers identified students with common areas of skill needs in literacy significantly ($p < .05$) more frequently than did upper grade teachers, $t = 2.14$, $df = 24$, $p = .043$.

Instructional reading level data. For analyzing instructional reading level data, primary grade teachers looked at the range of scores significantly ($p < .05$) more frequently than did upper grade teachers, $t = 2.15$, $df = 25$, $p = .042$.

Grade-level created literacy assessment data (common formative assessments). For analyzing grade level created literacy assessment data for a group of students, the data indicated no significant ($p < .05$) differences between primary grade teachers and upper grade teachers.

Analyzing data for individual students. For analyzing literacy data for individual students, primary grade teachers looked at overall literacy performance disaggregated by performance level such as Advanced, Proficient, Basic, Below Basic, and Far Below Basic significantly ($p < .05$) more frequently than did upper grade teachers, $t = 2.11$, $df = 24$, $p = .046$.

Differences in Choosing Assessments by Grade Taught

Survey questions 2-8 were analyzed using a Chi-square analysis to determine differences in assessment issues by grade taught. One result almost approached significance ($p < .05$) and is reported in Table 24. For Question 2—what factor teachers considered most important when choosing a method for assessing student reading performance, a higher percentage of upper grade teachers correctly responded alignment with instructional objectives than did the primary grade teachers, $X^2 = 3.76$, $df = 1$, $p < .053$.

Table 24. Differences in “What Factor Do You Consider Most Important when Choosing a Method for Assessing Student Reading Performance?” by Grade

	K-2	3-5	X^2	Df	p
Correct	9 56.3%	10 90.9%	3.76	1	.053
Incorrect	7 43.8%	1 9.1%			

Note: Correct response: alignment with instructional objectives.

K-2 and 3-5 Comparison of Frequency of Assessments Administered

The frequencies of assessments administered were compared between primary grade (K-2) and upper grade (3-5) teachers to determine if any one type of assessment was administered more frequently among primary grade teachers or upper grade teachers. Independent samples t tests were used to determine differences in type of literacy assessments administered by grade taught. The significant results are reported in Table 25.

Table 25. Differences in Type of Literacy Assessments Administered by Grade Taught

Type of Literacy Assessments Administered	Grade	t	df	p
Word lists	K-2 3-5	2.59	11.23	.025
Letter identification	K-2 3-5	2.78	24	.011
Phonemic awareness	K-2 3-5	2.98	10.58	.013

For types of literacy assessments administered, primary grade teachers administered word lists significantly ($p < .05$) more frequently than did upper grade teachers, $t = 2.59$, $df = 11.23$, $p = .025$; primary grade teachers administered letter identification assessments significantly ($p < .05$) more frequently than did upper grade teachers, $t = 2.78$, $df = 24$, $p = .011$; and primary grade teachers administered phonemic awareness assessments significantly ($p < .05$) more frequently than did upper grade teachers, $t = 2.98$, $df = 10.58$, $p = .013$.

QUANTITATIVE ANALYSIS SUMMARY FOR RESEARCH QUESTION 3

A summary of the survey data regarding differences in types of literacy assessments administered by grade taught found that primary grade teachers administer more assessments related to measuring how students are progressing towards learning how to read. Moreover, results showed that when it comes to analyzing standardized testing data, results showed that primary grade teachers looked at the range of scores more frequently than did upper grade teachers, and that they identified students with common areas of skill needs in literacy significantly more frequently than did upper grade teachers. Primary grade teachers also identified students with common areas of skill needs in literacy more frequently than did upper grade teachers, and that they looked at overall literacy performance disaggregated by performance level such as Advanced, Proficient, Basic, Below Basic, and Far Below Basic significantly more frequently than did upper grade teachers. However, when it came to assessment literacy or knowledge of assessment, particularly choosing a method for assessing student reading performance, upper grade teachers showed more knowledge with aligning assessments to measure student reading performance with standards.

QUALITATIVE DATA FOR RESEARCH QUESTION 3

The data suggest that variability does exist among primary (K-2) and upper (3-5) grade teachers. If such differences exist, does this variability affect data-driven decision making among primary and upper grade teachers? To begin to answer this question, the qualitative data findings presented for Research Questions 1 and 2 seem to suggest that when it comes to decision making, all participants engaged in similar behaviors related to data-driven decision making. The videotaped data team meetings illustrated how participants from grades one, three and five exhibited a systematic process for data-driven decision making and instructional decision making. It was through these behaviors that a systematic process involved the use of S.M.A.R.T. (Strategic, Measureable, Attainable, Relevant, and Time bound goals for student achievement) goals as one way that participants ensured alignment of curriculum, instruction, and assessment.

SUMMARY OF THE QUANTITATIVE AND QUALITATIVE ANALYSIS FOR RESEARCH QUESTION 3

One can conclude that despite differences in the type of literacy assessments administered by grade taught, differences in choosing assessments by grade taught, and differences in the frequency of assessments administered among K-2 and 3-5 teachers, it appeared that participants behaved in particular ways when it came to data-driven decision making. It is the ways in which teachers interact with data that leads us to the final research question of this study, “What decision-making models do teacher use when making data-driven decision making in literacy?”

Research Question 4: What Decision-making Models Do Teachers Use when Making Data-driven Instructional Decisions in Literacy?

Findings for Research Question 2 suggested that participants’ engage in a systematic process of analyzing literacy data. This systematic process involved what was previously described as the “alignment process” in this chapter. It was evident from the videotaped data team meetings that participants and their colleagues from grades one, three, and five shared similar behaviors or steps in *how* they aligned their curriculum, literacy instruction, and assessments – identifying a useful data source in literacy, analyzing the data by identifying areas of strength and weaknesses in student literacy performance, determining instructional practices related to an area of weakness (intended to be taught for six weeks), and creating pre-post assessments to measure the current reality for that particular area of weakness and to monitor student progress after the six weeks of intentional teaching.

To further explore how teachers make sense of data, it was necessary to explore the models of data-driven decision making that teacher use when analyzing literacy data. Chapter 2; the review of the literature presented three data-driven decision making models (DDDM). The videotaped grade level data team meetings were again used to answer this research question about use of the models.

DDDM MODELS

One model, developed by Mandinach et al. (2008), sees DDDM as an iterative process and describes characteristics or skills educators need to be data-driven based on a

data-to-knowledge continuum. This continuum suggests six skills crucial to the decision-making process. At the data level, individuals must *collect* and *organize* the data in a systematic way that makes sense; at the information level, individuals must *analyze* and *summarize* the data; and at the knowledge level, individuals must *synthesize* the information into usable knowledge. The final step is to *prioritize* the knowledge, which allows decision makers to determine what is most important, most pressing, or the most rational solution to a particular educational problem at a given time.

The outcome of this six-step process, moving from data to information to knowledge, is a *decision* in which individuals decide to implement an action plan, strategy or intervention to result in some sort of *outcome* or *impact*. However, depending on the impact, the individual may decide that he or she needs to return to one of the six steps, thereby creating a feedback loop, resulting in the need to collect more data, reanalyze the information, or resynthesize the knowledge. Because of this feedback loop, data-driven decision making is seen as an iterative process (Mandinach et al., 2008).

Another model of DDDM is “The Data Wise Improvement Process” developed by Boudett et al. (2005). This model addresses the cyclical nature of data-driven decision making and involves eight distinct steps with three major categories: Prepare, Inquire, Act in order to use assessment data effectively.

Another model of DDDM is the Ikemoto and Marsh (2007) model, which suggests that DDDM can vary along two continua: the type of data used and the nature of data analysis and decision making (see Figure 2). This model suggests that in a DDDM process, educators can utilize a wealth of different kinds of data that range from simple to complex. Therefore, the types of analyses and decision making also vary from simple to complex along the following dimensions: basis of interpretation (use of assumptions versus empirical evidence); reliance on knowledge (basic versus expert, such as consulting with advisors); type of analysis (straightforward techniques, such a descriptive analysis, versus sophisticated analyses, such as value-added modeling); extent of participation (individual versus collective); and frequency (one-time versus iterative).

A given DDDM process can fall within one of four quadrants depending on the level of complexity along the two continua. The four quadrants are basic (quadrant I), analysis-focused (quadrant II), data-focused (quadrant III), and inquiry-focused (quadrant IV). Basic

DDDM entails using simple data and simple analysis procedures whereas inquiry-focused DDDM involves using complex data and complex analysis.

To describe the models used by participants, qualitative data from the videotaped grade level data team meetings were analyzed to identify patterns and themes with regards to the decision making models teachers use when making data-driven instructional decisions in literacy.

QUALITATIVE DATA FOR RESEARCH

QUESTION 4

Qualitative data revealed that participants and teachers in grades one, three, and five engaged in data driven decision making using systems of data analysis that were consistent with the literature on data-driven decision making models. Characteristics of these systems included organizing for collaborative work, building a shared knowledge base, using standardized data testing data sources, engaging in data analysis, examining instruction, establishing S.M.A.R.T. (Strategic, Measureable, Attainable, Relevant, and Time bound goals for student achievement) goals, creating formative assessments, and follow-up.

Grade One

This Professional Learning Community encompassed all five first grade teachers, including Teachers A and B (n = 5). Participants' data analysis are described using Boudett et al. (2005) model of data-driven decision making (see Figure 9).

Organizing for collaborative work. The five first grade teachers engaged in Professional Learning Communities and held their first data team meeting of the school year. Their objective was to use the previous year's grade level District Literacy Benchmark data to create a S.M.A.R.T. goal in English language arts

At the start of the meeting, participants reviewed the purpose of professional learning communities. The following demonstrates how the group initiated the conversation about data.

Figure 9. Grade 1 data-driven decision making model.

A teacher leader, who is a part of the school’s Instructional Leadership Team, explained:

We know that the PLC (Professional Learning Communities) is guided by four critical questions of learning. If we consider these four questions, we function as a PLC and our students achieve. So if we believe all kids can learn, which we know they all can, what is it we expect them to learn, so that’s where our standards come in, and we spent four years on power standards (standards most heavily weighted on the California Standards Test). How will we know when they have learned it? So, our pre and post assessments and analyzing the data. How will we respond when they do not learn? And that is RTI (Response to Intervention).

Another first grade teacher added:

And that’s the purpose of the S.M.A.R.T. goal because that’s what we say. They didn’t learn it. So as a team, what are we going to do now that’s going to be different or more of in order to get into learning?

Identifying the data source. The first grade group then proceeded to determine the data source to be analyzed. The following exchange represents which assessment information first grade teachers valued the most.

“So, today’s focus are ELA (English Language Arts) S.M.A.R.T. goals and in thinking about first grade, it gets a little difficult, since we don’t have CST (California Standards Test) data.”

“Since we set a S.M.A.R.T. goal at the beginning of last year and that led into our first benchmark, we can look at benchmark 1 and see what the S.M.A.R.T. goal was and how they did. That gives us an idea of where we need to be after the first semester of the year.

And then if we looked at benchmark three, we would see where the students exited and that would give us an indication of what was one of those things that they really needed to have throughout the year.”

After reaching consensus by deciding that the data source to be analyzed would be the multiple-choice district’ literacy benchmark 1 from the previous year, the participants proceeded to analyze the data using methods of item analysis, identifying total percentage correct, and aggregating the data by English language arts standards.

Data analysis. The following exchange highlights the participants’ methods of data analysis:

“So, I’m looking at the percent correct for the questions and the standards.

“Or on the front of the report, you can look at the standards that you have and then the column all the way to the right is as a grade level where we were at. And it breaks up right there where it says word analysis.”

“So, this clumps all of them together so our word analysis was 66, reading comprehension 61, written conventions 65, writing strategy, almost 70, literary response 56, and then it breaks down further.”

“So our reading comprehension 1.2 was actually the weakest standard.”

“So 1.2 was identify the top title of the author of a reading selection.”

“What does that look like on the benchmark? “

“It’s tricky.”

“Can someone show us all?”

Item analysis. Identifying the weakest areas led the group to look at the actual test question by referring back to the item on the actual assessment and then using a frequency distribution to compare students selected answers to see if the scores are evenly spread out or clustered around one answer.

The following exchange illustrates the participants’ use of item analysis and frequency distribution.

“It’s the one that says (participant referring to an item on the assessment), “Which one of these is the title of the text?”

“The answer is B, My Pet Turtle.”

“62% of the students picked A, By Mary Jones, and only 29% picked B. 19% picked C. 5% picked D.”

“Yeah, that was a common confusion, author and title.”

“I think we stress author more than title when we teach it.”

Establishing a S.M.A.R.T. goal. The group then proceeded to look at a second data source to compare it to the first data source (the multiple-choice district's benchmark 3 from the previous year). The group discovered that sight words were found on benchmark 1 but not on benchmark 3. Therefore, the group concluded that sight word instruction should occur at the beginning of the year.

One teacher explained while examining both benchmarks, "We're expecting them to be learning these at the beginning of the year because then when you look at the end of the year, you're focusing on reading comprehension, there's many more questions on reading comprehension on benchmark 3.

Another teacher said, "We know that their reading is 80% high frequency words. So that they have those automatically in order to spend the time decoding the unknown words and building their fluency.

Another teacher added, "Yeah, I think focusing on sight words as a S.M.A.R.T. goal would be good. We already have a pre and post that we created last year that we could use."

Formative assessment and follow-up. The group then proceeded to agree that they would administer a pre-assessment to identify their current reality of how many students are already proficient and use this to determine their S.M.A.R.T. goal, use research-based strategies such as direct, explicit instruction for six weeks, then administer a post-assessment and meet again to analyze the data to determine if they met their S.M.A.R.T. goal.

Grade Three

This Professional Learning Community encompassed all five first third teachers, including Teachers C and D (n = 5). Participants' data analysis are described using Mandinach et al.'s (2008) conceptual model of data-driven decision making that moves along a continuum, from data to information, to knowledge, to a decision, and then to an action plan. This model recognizes that teachers may stop at any point along the continuum and return to an initial step or stage along the continuum, thereby creating a feedback loop. Grade 3's data driven-decision making illustrated such a feedback loop, resulting in the need to return to a step along the continuum and then proceeding to want to collect more data to analyze (see Figure 10).

Figure 10. Grade 3 data-driven decision making model.

Organizing for collaborative work as a data team. The five third grade teachers engaged in Professional Learning Communities and held their first data team meeting of the school year. Their objective was to use their previous year's grade level standardized testing data, aggregated by all third graders, in English language arts in order to create a SMART goal in English language arts.

Data Analysis: From information to knowledge. Data Analysis began with participants comparing their aggregate data by first identifying their grade level's average proficiency and then comparing this to the districts. Performance was reported by percentile, showing the percentage of proficient or advanced students for each California Reading Language Arts cluster of word analysis, reading comprehension, response to literature, written conventions, and writing strategies. This method of comparison resulted in the participants' ability to draw conclusions about their achievement data—thus turning the data into information.

As participants identified areas of success or gains and areas of weaknesses, they deliberately took into consideration the state's CST (California Standards Test) Blueprint to identify items most heavily-weighed on the CST as a determining factor in selecting an area to focus on. The following exchange demonstrates the group's conversation about data.

So our data protocol (established set of guidelines for looking at data) should really only take 60 minutes...In terms of looking at our data, the protocol says to take a look at a set of data and then identify areas where most students did well. So, we're going to really focus on the successes that we see with the data. It makes sense to first take a look at grade-level data and then we can drill down by class. But just take a look at your summary sheet, which is a cluster report.

"71%, so that's certainly a bit of a success. So, literary response. And analysis huh? And I'm going to say this off the top of my head, but that appears to me to be the hardest one."

"And that's like eight questions. So it's 12% of the ELA, and these are the types of questions or skills that students were asked to do. This is the blueprint if you want to take a look at it. So they were asked to distinguish common forms of literature like fiction, nonfiction, comprehend basic plots of classic fairytales, mixed folktales, fables, determine what characters are like by what they say or do, so a character analysis, and determine the underlying theme or author's message."

"If you look at reading comprehension, it's at 66.6%. The district was only 71.7%."

Prioritizing to establishing a S.M.A.R.T. goal. It appeared that participants used their knowledge of standardized testing to prioritize what was most important. The participants began to prioritize instruction by considering areas in literacy that would lead to a 10% increase in proficiency as compared to last year. One participant explained, “I’m just wondering, you know, where we are going to get the most bang for our buck. If we want 10% growth, where are we going to get it?”

Another participant responded, “So, what are those high-leverage areas we could focus on. Like if we focus on word analysis, you could probably make the prediction that as your kids get stronger in word analysis, you know, they’ll be able to decode multisyllabic words and that will help with comprehension.

Another responded, “The most questions are antonyms, synonyms, homophones, homographs. Then the one that will carry the most into fourth and fifth grade is use sentence and word context to find the meaning of unknown words.

Another participant admitted, “I’m just thinking that sometimes we want to start out with reading comprehension and really the issue is they can’t decode, they don’t know sight words, so you know, doing reading comprehension doesn’t make sense right now. “

In response, another participant stated,

You guys can disagree with me. But written conventions and writing strategies, like I know that those were really low, but because they’re not weighted as heavily, but also because we have a new program for it, that maybe we should try word analysis again. We don’t have a word analysis program. So that would help us get something together.

Feedback loop #1. This exchange led the group to want to return to an initial step along the continuum of data analysis, by expressing the need to for more data. The participants decided to examine word analysis performance data from the previous grade level, second grade, to ensure that the area they were selecting was truly in fact “high leverage” or an area of need. The hypothesis was that if students from second grade performed low in word analysis, then the assumption was that entering third grade students needed acceleration or immediate intervention in that area.

Formative assessment and follow-up. After selecting word analysis for their S.M.A.R.T. goal, similar to what Grade 1 did, participants agreed that they would administer a pre-assessment of a common formative assessment that they had already created to identify

their “current reality” of how many actual students were already proficient. The formative assessment data would be used to determine their S.M.A.R.T. goal. From there, they discussed the use of research-based strategies to use during their six-week S.M.A.R.T. goal, and established a date to administer a post-assessment and reconvene to analyze that data to determine if they met their S.M.A.R.T. goal.

Feedback loop #2. During the formative assessment and follow-up stage, participants expressed the need to progress monitor throughout the six-weeks rather than waiting until the end of the S.M.A.R.T. goal cycle to evaluate student performance. They felt that it was too late to wait for the end of the S.M.A.R.T. goal or the outcome stage of the continuum, which was six-weeks, and that more frequent progress monitoring would influence their teaching.

One participant suggested,

It’s important that we bring data, writing samples of high, medium, and low so we can really see what’s going on. Then we can see what kind of instructional strategies work. We can see where they’re making mistakes and what’ they’re doing.

Unknowingly, it appeared that participants engaged in a second feedback loop by wanting to establish indicators and measure performance throughout the six-weeks and using those indicators or student work as the data to be analyzed along the same continuum of analysis.

Grade Five

This Professional Learning Community encompassed all four fifth grade teachers, including Teachers E and F (n = 5). The four fifth grade teachers held their first data team meeting of the school year. Their objective was to use their previous year’s grade level standardized testing data, aggregated by all third graders, in English language arts in order to create a SMART goal in English language arts.

Organizing for collaborative work. The four fifth grade teachers engaged in Professional Learning Communities and held their first data team meeting of the school year. The objective was to create their first S.M.A.R.T. (Strategic, Measureable, Attainable, Relevant, and Time bound goals for student achievement) goal in English language arts

using state standardized testing data. Participants' data analysis are described using the Boudett et al. (2005) model of data-driven decision making (see Figure 11).

Figure 11. Grade 5 data-driven decision making model.

Building a shared knowledge base. The group's data analysis included discussions on the reliability of cohort data. One participant stated,

Everybody wants to compare cohort data, third grade to fourth grade, fourth grade to fifth grade. You can't do it. It's like apples and bananas. They're fruits. But that's about the only similarity there is. And the reason why is because the eights are very different. Let's look at word analysis just for third and fourth grade. The minimum proficiency for word analysis is 71%. Look in fourth grade, it's 78%. In reading comprehension, the minimum proficiency is 63% in fourth grade. Third grade 77%. So not only is it weighted differently, the minimum proficiencies are different.

Another participant added that when looking at standardized testing data, it was important to focus on "systems errors," particularly, what does the data say about which systems, programs, policies, procedures are currently working or not working for increasing student achievement. The participant proceeded to explain,

What you look at here are systems errors. Let me give you an example. So, 40% of the kids were proficient in measurement. How could that be? The only thing I can get from this data is at the end of the year; we never get to that because it's always before testing. Or curriculum was in place that may show us we were strong or really weak because we do not have a writing program.

Another participant provided an example,

Yeah, let me give you an example of a student. Debbie in fourth grade was proficient at word analysis. She got 74.4%. But in fifth grade she wasn't

proficient. Do you see what happened with that same student? Maybe that student is proficient in fourth grade but not in fifth grade because it's a lot easier for me to be proficient in fourth grade in word analysis than it is in fifth grade.

"Because the percentage is lower."

"A good 10 points, 10 percentage points."

Data analysis. The group then proceeded to analyze the data by identifying the lowest percentile gains and by comparing the score to the district or in comparison to the minimum proficiency. Similarly to Grade 1, the group identified strengths and challenges and felt that standardized testing data were only one measure of achievement and that more data were needed to draw conclusions. A participant suggested,

This is really unfair because we need more than one measure. We need to look at different data. We need to look at benchmarks, CST (California Standards Test) data; we need to look at individual students, and grade level data.

Establishing a S.M.A.R.T. goal. During their data analysis of the state's standardized testing data, participants repeatedly referred to the CST Blueprint to determine "high leverage" standards by comparing weights and percentages on the CST English language arts standardized test. A participant stated,

So take a look at your blueprint and if you actually go to the actual standard for writing strategies, that's on page 17. You can see how it says total number of items, there's 16 items just on writing strategies. That's 21% of the English language arts CST test.

Another participant responded, "and then you can go into the release test questions and then you can look at how it is assessed."

The group continued to discuss areas of strengths and weaknesses until they determined an area to focus on for a six-week S.M.A.R.T. goal.

Formative assessment and follow-up. Similar to Grade One and Grade Three, the fifth grade participants agreed that they would administer a pre-assessment to identify their current reality of how many students are already proficient and use this to determine their S.M.A.R.T. goal, use research-based strategies, administer a post- assessment and meet again to analyze the data to determine if they met their S.M.A.R.T. goal.

THEME ONE: TEACHERS PERCEIVED PROFESSIONAL LEARNING COMMUNITIES AS SUPPORTING DATA-DRIVEN DECISION MAKING.

All three grade levels engaged in professional learning communities. Professional Learning Communities encouraged the use of data, while focusing on student learning. Data teams became essential to professional learning communities. It was evident that characteristics of data-driven decision making models were used among teachers as they analyzed data. Similarities were revealed among grades 1 and 5, and can be described using Boudett et al.'s (2005) model of data-driven decision making. On the other hand, grade 3 demonstrated the "feedback loop" illustrated in Mandinach et al.'s (2008) model of data-driven decision making by returning to the initial step of the model-collecting data.

THEME TWO: BUILDING A SHARED KNOWLEDGE-BASE WAS IMPORTANT TO TEACHERS AS THEY MADE DATA-DRIVEN DECISIONS.

During the fifth grade data team meeting, consisting of four teachers, the group proceeded to use a data protocol until a teacher, new to the school site this year, interrupted the grade level facilitator and asked, "Really quick, could you just tell me the difference between a power standard and a standard?" The following exchanges describe the use of power standards for indentifying what is most essential to teach students.

We call them essential standards....what they did is they looked at all the standards and actually Marzano (2001) did some research. It would take 23 years to get through K-12 standards. So what districts and gurus say to do is what standards are leveraged? What standards are the most important standards?

"OK. So it's the most important things that they're tested on?"

"Not necessarily tested on."

"Or that they need to leave with?"

"Yes."

"Three criteria to make it a power standard (heavily weighted on California Standards Test). One high leverage, the one that's heavily weighted on most standardized tests will help in other content areas and then there's endurance. So what are those standards that will help our students be successfully when they leave school. Then there's readiness for the next level of learning."

THEME THREE: TEACHERS' PERCEPTIONS OF THE IMPORTANCE OF STANDARDIZED TESTING INFLUENCED THEIR DATA-DRIVEN DECISION MAKING

Consistent with quantitative findings reported for Research Question 1 that indicated that standardized testing were important to teachers, all three grade levels made reference to the CST (California Standards Test) Blueprint to determine items most heavily weighted on the California Standardized test. Furthermore, all three grade levels utilized the Released Test Questions to become familiar with how items were being assessed.

THEME FOUR: NOT ALL TEACHERS USED LITERACY DATA TO IDENTIFY SYSTEMS ERRORS

Grades one and three focused on using data to identify strengths and weaknesses. However, grade five focused on using the data to identify systems errors, specifically addressing what the data revealed about curriculum programs, policies or procedures. This finding is significant as a recurring theme from this study was teachers' perceptions of the need to align their curriculum, instruction, and assessment. Therefore, one would predict that all grades would use data to identify systems errors in curriculum

THEME FIVE: TEACHERS WERE NOT AFRAID OF DATA. THEY ACTUALLY WANTED MORE DATA

All the teachers in grades one, three and five were not afraid of data. In fact, they wanted more data to assist with their decision making. Grade three, in particular, wanted to analyze grade two data, while grade five felt that multiple measures of achievement data besides standardized testing data were needed.

As previously described, during third grade's videotaped data analysis team meeting, the teachers were uncertain about choosing an area of need based on the data. This was evident in their conversations about word analysis, reading comprehension, and written conventions and their interest in wanting more data. As previously noted, their data-driven decision making (DDDM) model illustrated Mandinach et al.'s (2008) DDDM model that

acknowledges a feedback loop, stopping at any point along the continuum and returning to a previous step (wanting more data) along the continuum.

SCOPE OF ANALYSIS: SIMPLE OR COMPLEX?

Qualitative analysis of videotaped grade level data team meetings revealed that grades one, three, and five utilized data for inquiry. In fact, while it may appear that they used simple data sources such as aggregate achievement data from district benchmark data and standardized testing data that offered percentiles representing percentage of students who were proficient or advanced, their scope of analysis focused on using data for student improvement. Each scope of analysis from grades one, three, and five was systematic, each grade followed a series of steps as they engaged in data analysis and data-driven decision making around SMART goals. It appeared as teachers turned the data into knowledge their decision making became strategic, measureable, attainable, realistic and relevant and time bound.

CHAPTER SUMMARY

Findings discussed in this chapter contribute to the literature on teachers' instructional decision making (Shavelson & Stern, 1981; Shulman & Elstein, 1975) and on data-driven decision making (Marsh et al., 2006). The combination of quantitative and qualitative data sources addressed each research question and provided the opportunity to confirm or disconfirm the research findings presented in the data.

From the analysis of the data, significant findings were revealed that resonated throughout this chapter. In summary, teachers shared common beliefs about the role of data in teaching by placing more emphasis and value on common formative assessments, demonstrated common behaviors and characteristics of the need to align curriculum, instruction, and assessments. They shared common perceptions about themselves as problem solvers and decision makers. The idea of being an intuitive statistician was evident in their instructional decision making for both a group of students and for an individual student.

In the literature review in Chapter 2, it was noted that formal training is one unique characteristic needed for effective decision making to take place. The teachers in this study

reported that they lacked formal training in assessment and assessment in literacy, in spite of such training being provided at the school.

CHAPTER 5

DISCUSSION, IMPLICATIONS AND RECOMMENDATIONS

This chapter restates the problem, the purpose of the study, and how this study contributes to the literature on data-driven decision making. It combines key concepts from the literature on data-driven decision making, teachers' instructional decision making, and teachers' knowledge or competency in assessment literacy with key findings from the study. Limitations to the study are also discussed. Finally, it concludes with recommendations that will have implications for districts, schools, administrators, literacy coaches and staff developers, and classroom teachers using student assessment information to inform literacy instruction to better serve students at every level.

PROBLEM OF THE STUDY

Major reforms in public education resulting from No Child Left Behind have led to a renewed interest in assessment for accountability and assessment to inform instruction. Educators have moved towards a culture of being data-driven, and have declared data use in schools to be significant to school improvement and accountability (Marsh et al., 2006). Yet, as school districts make great strides in creating a culture of data-driven decision making – collecting, analyzing and interpreting data – little is known about how individual teachers make sense of data and how they use the data to inform instruction.

RATIONALE FOR THE STUDY

Researchers who championed the investigation of effective schools and the characteristics associated with high levels of teaching and student achievement have found that schools that support data use by establishing data-driven decision making models to improve teacher practice and student learning show remarkable performance in teaching and learning (Cicchinelli et al., 2007; Guskey, 2007; Stiggins et al., 1986).

Moreover, measurement or assessment research concludes that assessment is an integral part of the classroom environment. As both large and small scale districts pour

millions of dollars into comprehensive, integrated data warehouses promising to provide schools with easy, timely access to multiple assessment data, the current reality for many schools is that the problem does not lie in a shortage of data, but that schools are actually drowning in data (DuFour & DuFour, 2008; Reeves, 2008). Unanswered questions remain about the type of literacy data most meaningful to classroom teachers and how classroom teachers interpret and use the data to make instructional decisions about students. This study will contribute to the field of teacher decision making in literacy by investigating how teachers use data for instructional purposes and improved student performance. Stiggins et al. (1986) argue, “Until we understand assessment in the teacher’s world in terms relevant to the teacher and translate our concepts into those terms, we will remain unable to alter teachers’ perceptions of either the validity or the relevance of those concepts” (p. 15).

PURPOSES OF THE STUDY

The purposes of this study was to investigate and describe the ways in which teachers at the elementary level use multiple types of literacy data, and to investigate the types of decisions teachers make with the data to accelerate student achievement in literacy.

DESIGN OF STUDY

To explore the data-driven instructional decisions made by classroom teachers using literacy assessment data, this was a phenomenological study using multiple measures including a web-based group administered survey, stratified random sampling for structured interviews, and videotaping of grade level data analysis team meetings. A process tracing approach was used as the primary method to reveal teachers’ data-driven instructional decision making. Using this approach, six teacher participants were asked to “think aloud” while performing a task, solving a problem or reaching a decision (Shavelson, 1983). The process in which teachers evaluated student performance and reached a decision related to students’ strengths and challenges were analyzed. While this approach is not traditionally used in measurement or assessment research, scholars in this field suggest that this type of approach would uncover the answers to teachers’ data-driven decision making (Stiggins et al., 1986).

RESEARCH QUESTIONS

Four main research questions guided this study:

1. In what ways do teachers' experience, knowledge of literacy and beliefs about literacy instruction influence teacher decision-making?
2. How do teachers make data-driven instructional decisions in literacy?
 - a. What literacy assessment information do teachers find useful and use more often?
 - b. How do teachers determine interventions for individual and groups of students based on data?
 - c. What kinds of interventions do teachers identify?
3. What data-driven decision-making differences exist between primary (K-2) and upper grade (3-5) teachers?
4. What decision-making models do teachers use when making data-driven instructional decisions in literacy?

KEY FINDINGS FROM THE REVIEW OF THE LITERATURE

A review of the literature suggested that teachers need guidance in translating data into useful information, and that most teachers do not have formal training in assessment literacy (Schafer & Lissitz, 1987; Wise et al., 1991). As previously noted, using data effectively is a complex process, but with proper training, data use can improve instruction (Protheroe, 2001). According to Stiggins et al. (1986), teachers spend an estimated one third of their professional time in assessment-related activities, and that many of these activities require skills in testing and measurement. While teacher training in data fluency and assessment literacy has not been given the emphasis that its role in teaching demands, particularly in teacher preparation courses, schools and districts are now beginning to address this issue.

Sweeping into the schools and classrooms across the nation is the shift to data-driven professional development practices where teachers assess students, aggregate the data, and collaboratively meet to discuss assessment data results, with the end goal of using the assessment data to make adjustments to their teaching practices. A considerable body of research on the use of classroom assessment to promote student learning is well established in educational research (Black & William, 1998; Fullan et al., 2006; Hall & Harding, 2002; Tierney, 2006).

While the strategic use of assessment data are necessary for increasing student achievement, many studies have noted that it is the expertise of the classroom teacher that is a determining factor in the teaching of reading and continued literacy achievement (Block et al., 2002). As a result, school leaders have been called to create professional development structures that support adult learners in developing their teaching expertise. Fullan et al. (2006) propose that it is essential for schools to move toward a new reality in which diagnostic practitioners, who have a solid core of beliefs and understandings about teaching and assessment, develop highly personalized programs that match the needs of individual pupils.

KEY FINDINGS FROM THE STUDY

Findings from Chapter 4 explored the type of literacy data most meaningful to classroom teachers and how classroom teachers interpret and use the data to make instructional decisions about students. Developing conclusions from the key findings from this study, coupled with key concepts from the literature on data-driven decision making, teachers' instructional decision making, and teachers' knowledge in assessment, suggest that data and instruction go hand-in hand, standardized testing influences decision making, teachers' knowledge of assessment makes a difference, and that teachers see themselves as part of the data-driven decision making process.

1. Data and Instruction Go Hand-in-hand

Findings from this study indicated that the alignment between data and classroom instruction is significant for effective decision making and literacy achievement. The tight alignment between data and classroom instruction is significant as, findings from the review of the literature on assessment purposes in literacy suggested that the real focus of assessment should emphasize “assessment *for* learning” where classroom teachers use assessments to improve teaching, learning, and instructional decision making (Ainsley & Viegut, 2006; Black & William, 1998; Guskey, 2007; Reeves, 2008; Stiggins, 2002).

It is important to remember that children are different not only in their interest and backgrounds, but also in their literacies and acquisition of literacy development. For that reason, scholars and educators argue for more teacher-directed, curriculum-embedded assessments that involve multiple measures, that are formative and diagnostic, and are

adaptive to the changing needs of students' literacy development and instructional opportunities (Campbell, 2001; Tierney, 1998).

In response to this key finding, it is clear that schools must deliberately ensure a tight alignment between data and classroom instruction. How do schools do this? Could it be that common formative assessments are the key? The data from this study seemed to suggest that teachers think that common formative assessments play a role in such an alignment.

In fact, the data revealed that teachers favored common formative assessments over state standardized tests and district benchmarks because the assessments most closely aligned to their classroom instruction and provided timely, relevant feedback about teaching and learning. Guskey (2007) maintains "Teachers trust the results from these assessments because they relate directly to instructional goals in the classroom." Indeed, the literature supports the idea that teachers do in fact prefer these types of assessments over large-scale assessments.

2. Standardized Testing Influences Decision Making

Despite the preferred and frequent use of common formative assessments by teacher participants, the data also revealed that items on standardized testing do in fact influence teacher decision making. Both quantitative and qualitative data revealed that teachers prioritized instruction based on standardized testing items, particularly items most heavily weighted on standardized testing, and created S.M.A.R.T. goals based on this data. Furthermore, an analysis of the data-team meetings described the use of S.M.A.R.T goals as a common theme to ensure that curriculum, instruction, and assessments were strategic, measureable, attainable, relevant and time bound – thus making instruction and assessment tightly aligned.

Information captured from the data-driven decision making models that teachers used during their data team meetings illustrated that the use of standardized testing data in English language arts was significant when making data-driven instructional decisions in literacy, and that teachers prioritized instruction based on these items. Moreover, teachers' instructional decision making in literacy for students focused on "power standards" or the heavily weighted items and standards-based instruction.

It is not surprising that standardized-testing data are still important to teachers since reforms in public education have led such initiatives as standards-based education, assessment, and accountability. Such initiatives have placed increasing pressure on schools to improve reading test scores and make adequate yearly progress or face accountability sanctions such as program improvement status. Despite its emphasis on accountability, standardized tests do give schools a sense of urgency. Schmoker (2000) contends that, “Standardized test results have provided the essential focus and urgency for schools to improve and refine instructional programs and practices in reading and writing” (p. 64). Moreover, Reeves (2008) maintains that a comprehensive accountability system is necessary for effective decision making.

The use of standardized testing data as a basis for establishing S.M.A.R.T goals in English language arts by teacher participants showed that standardized testing is still high stakes and influences instruction. This was evident in two ways. First, as teacher participants established S.M.A.R.T goals in their data teams, their goals were strategic. Again, they focused on “power standards” or the heavily weighted standardized test items. Second, their common formative assessments for their S.M.A.R.T. goals matched heavily-weighted standardized testing items in its language and in the form of how it is tested.

3. Methods of Data Analysis Do Exist but Vary Depending on the Type of Assessment

Two main methods of data analysis were revealed by participants: item analysis and disaggregating data by subgroup.

ITEM-ANALYSIS

Results revealed that the most frequent method of data analysis during grade level data-team meetings was disaggregating testing data by doing an item analysis. The data showed that teacher participants looked at each strand in Reading Language Arts (reading comprehension, literary response and analysis, word analysis, writing strategies and written conventions) to compare how students performed and to identify the strongest and weakest areas of instruction.

DISAGGREGATING DATA BY SUBGROUP

A significant finding revealed that teacher participants disaggregated subgroup data less frequently (every nine weeks) for standardized testing data, district literacy benchmark data, and instructional reading level data (running records) but more frequently (monthly) for common formative assessment data. As a result of standards-based accountability policies that put pressure on low-achieving schools to meet a series of annual academic performance goals or Adequate Yearly Progress (AYP) for numerically significant subgroups, one would expect to see teachers (analyze and disaggregate subgroup data more frequently) at this low-performing, high poverty school, in one of the most economically challenged, government-assisted neighborhoods, who had been in program improvement from 2004-2010. This finding is similar to findings from Diamond and Coopers' (2007) study that examined data use in elementary schools with varying accountability contexts. This study found that low-achieving schools devised strategies to avoid sanctions and raise student achievement quickly by targeting their resources on a narrow range of students such as significant subgroups in order to demonstrate rapid gains in the test scores of those students.

IDENTIFYING STUDENTS WITH COMMON AREAS OF SKILL NEEDS

A significant finding from the data was that teacher participants identified students with common areas of skill needs in literacy as the most frequent method of data analysis when analyzing state standardized literacy data, district literacy benchmark data, instructional reading level data, and common formative assessment data, and used this form of analysis on a weekly basis. During the interviews and on the survey, teacher participants described various types of interventions for a group of students and for individual students, ranging from research-based teaching strategies such as more direct, explicit instruction and use of various programs.

4. Teachers' Knowledge of Assessment Matters

The works of Shavelson and Stern (1981) and Shulman and Elstein (1975) characterize decision making as being pervasive in teaching, and that decisions are involved in almost every aspect of a teacher's professional life. Their work revealed that teachers are

intuitive statisticians with the ability to analyze and make recommendations to improve student achievement.

While the data revealed that teacher participants were specific and strategic when designing literacy interventions for a group of students and for individual students, the data did not support this finding when it came having teachers demonstrate their knowledge of assessment on the multiple-choice survey that evaluated how teachers choose, develop, administer, score, and interpret literacy assessments. The findings reinforced Schafer and Lissitz' (1987) meta-analysis study that identified the complex skills or competencies necessary for data analysis. Similar to Schafer and Lissitz' findings, it appeared that increasing teachers' shared knowledge about assessment and literacy assessments was essential for effective data analysis and decision making.

The study data indicated that teachers had the greatest knowledge in choosing, developing and administering literacy assessments, but struggled with scoring and interpreting literacy assessments. According to their responses on the multiple-choice survey items, the data revealed that building teacher capacity in assessment and data analysis is key. For example, when teacher participants were asked on the survey, "What factor do you consider most important when choosing a method for assessing student reading performance?" 70.4% reported alignment with instructional objectives (the intended answer). On the other hand, when teachers were told that Frank, a beginning fourth grader, received a G.E. (grade equivalent score) of 3.0 on the reading comprehension subtest of a standardized test and asked to interpret what it meant, only 26.9% of the respondents interpreted that the score meant that Frank scored as well as a typical beginning 3rd grader scored on this test, while 61.5% interpreted that the score meant that Frank is performing at the 3rd grade level (not the intended answer).

The call for school leaders to increase data fluency is significant as the review of the literature suggested that teachers need guidance in translating data into useful information and that most teachers do not have formal training in assessment and data literacy (Schafer & Lissitz, 1987; Wise et al., 1991).

When it came to demonstrating their knowledge of the use of running records, the survey data indicated that while 50% of the participants rated running records as an important literacy assessment in gathering information about students' reading behaviors, only one

teacher described the use of miscue analysis to analyze running records during the interviews, which is a subset of running records.

The data, coupled with the literature on teachers knowing how to use assessment data to improve student learning, suggests that classroom teachers need assessment training or professional development on data analysis and interpretation. A review of the literature assumes that classroom teachers are fully equipped with a repertoire of approaches and skills in data analysis and know how to use the data to improve student learning. As previously argued in this study, the importance of knowing how to use assessment data to improve student learning cannot be overestimated. A growing body of research suggests that the use of high-quality assessment data, in the hands of classroom teachers trained how to use it effectively, can improve instruction (Protheroe, 2001).

Similarly, Fullan et al. (2006) contend that, in order to improve the effectiveness of classroom instruction so that it more precisely responds to the needs of students, teachers need to become proficient in using assessment to monitor and manage student learning. Protheroe (2001) add that, “finding good data and using it effectively is actually a complex process—one that schools are just beginning to address.” The notion is that by supporting classroom teachers with effective complex data analysis, they can make informed decisions about instruction.

During the teacher interviews that asked teachers to describe their experiences with learning how to analyze literacy data, participants’ responses revealed that the school and district failed to meet their data-driven needs, and that the school tended to focus on the initial steps of data-driven decision making: collecting and organizing the data. Therefore, it is not surprising that teachers were strongest in the areas of choosing, developing and administering assessments, as this has been the focus of the school. If effective data analysis leads to improved instruction and student achievement, findings from this study revealed that schools must improve the quality of training in assessment literacy and data analysis.

5. Not All Teachers Understand How to Use the Data to Inform Instruction

The data revealed that teacher participants viewed themselves as being a part of the problem too. In fact, all participants concurred that in order to help all students achieve, changes need to be made with their own teaching. All teacher participants implied that the

use of data forces them to reflect on their own teaching to adjust, change, prioritize, or enhance instruction. The following illustrated how one third grade teacher made adjustments to her teaching based on literacy data:

So, we did a S.M.A.R.T. goal for synonyms and antonyms and created pre-post assessments (common formative assessments). And the way we taught it wasn't very successful because we looked at the data before and we looked at the data after and it wasn't very successful. So then, on my own, I thought about what we need (students) and then created like two weeks of a unit meant to build vocabulary because when I analyzed the data, it wasn't that they didn't understand what a synonym or what an antonym was but they didn't have enough vocabulary to be able to identify synonyms and antonyms for words, they didn't have the skills to understand how to figure out meaning and context.

The literature on teachers' instructional decision making reveals that teachers continually use formal and informal assessment information to diagnose individual student needs and to inform instruction. However, the power of data use lies in not only diagnosing student needs but teacher needs as well. Lapp et al. (2001) categorize the purposes of assessment as follows: (1) diagnosis of individual student needs, (2) provision of accountability information, (3) evaluation of programs, and (4) informing literacy instruction. Furthermore, Fisher and Frey (2008) conclude that the purpose of assessment use in schools should be to:

- Assist in student learning
- Identify students' strengths and weaknesses
- Assess the effectiveness of a particular instructional strategy or curriculum programs
- Assess and improve teaching effectiveness
- Provide data that assist in decision making.

Unfortunately, informing one's literacy instruction and teaching effectiveness is overlooked or avoided in schools. It requires teachers to be honest, reflective, and open-minded towards new teaching strategies and new learning. Many studies have noted that it is the expertise of the classroom teacher that is a determining factor in the teaching and reading of continued literacy achievement (Block et al., 2002). If we expect to diagnose students' reading difficulties and determine interventions for students, it is crucial for teachers to realize that they are a part of the problem too.

LIMITATIONS

Limitations to this study include population validity, the relationship of the researcher with the participants, and the types of literacy assessments utilized for the study instruments.

This was a single school study in one school district with 27 participated in the study. Of the 27, six participants were selected using stratified random sampling, to participate in the interviews. Furthermore, qualitative data collected from the videotaped grade level data team meetings were limited to one videotaped session rather than multiple sessions. Therefore, the ability to generalize the findings to a larger population is reduced.

The researcher was concurrently a Literacy Resource Teacher at the research site who provided professional development to teachers and intervention to students not meeting grade level standards. She also facilitated Professional Learning Communities.

The types of literacy assessments used in the survey instrument did not include phonics assessments, but focused on phonemic awareness instead. To provide a more accurate picture of students' literacy needs, both types of assessments are important.

RECOMMENDATIONS FOR PRACTICE

The need for teachers to make decisions is not a new idea. Nearly 30 years ago, Shavelson and Stern (1981) and Shulman and Elstein (1975) showed that decision making is pervasive in teaching and is a part of every aspect of a teacher's professional life. Their work brought attention to teacher decision making by concluding that teachers are *intuitive statisticians* with the ability to make data-driven instructional decisions. Data-driven instructional decision making is a vital component in school efforts to reform and improve education. But as long as educators continue to view teaching in the absence of data fluency, they will miss out on the powerful effects that data-driven decision making has on learning *and* teaching. In fact, school leaders must consider that teachers have a far more strategic and deliberate purpose—they need to make sense of multiple types of literacy data and use the data to inform instruction.

Changing the Assessment Culture of a School

Indeed, fundamental transformations in the cultures of schools need to take place for schools to move towards a focus on data-driven decision making. In fact, school leaders and administrators need to realize that the problem does not lie in a shortage of data, but that

schools are actually drowning in data. However, classroom teachers are not fully equipped with the knowledge base surrounding assessment and a repertoire of approaches and skills in data analysis to know how to use the data to improve student learning and classroom practice (DuFour & DuFour, 2008; Guskey, 2007; Reeves, 2008).

Research shows that transforming data into useful knowledge to improve student learning and instructional decision making is a complex undertaking, and that the use of high-quality assessment data, in the hands of classroom teachers trained how to use it effectively, can improve instruction (Mason, 2002; Protheroe, 2001). Moreover, the work done by Stiggins (2002) reveals that educators must create quality, formative assessments that include a clear purpose for the assessment and a clear achievement target for what needs to be assessed, and, which accurately reflect the target and satisfy the purpose. School leaders and teachers need to build a shared knowledge base surrounding assessment, create common formative assessments, and align curriculum, instruction, and assessment.

Unfortunately, schools spend most of their time in the initial phases of data-driven decision making – collecting and organizing data for teachers – and steer clear of the more complex phases of analyzing and interpreting the data.

Move Along the Data-Driven Decision Making Continuum

It takes an insightful leader to realize that data-driven decision making involves moving away from just collecting and organizing data for teachers and toward building a shared knowledge base around assessment literacy and data analysis. In fact, school leaders need to become a part of the data-driven decision making process with teachers by asking with relentless purpose:

- What types of data are being used in our school and why?
- What types of decisions are being made about the data?
- What is our school's evidence of alignment of our data and with our school's curriculum and instruction?
- How is our school building capacity so that teachers can respond and react to data more effectively?

Teach Teachers How to Swim with Data by First Listening to What They Have to Say

If teachers are drowning in data, we must teach them how to swim with data by listening to what they have to say about data. If we want teachers to respond and react to data, we need to think more carefully about the ways assessment information is presented to teachers. Participants' responses during the interviews revealed the following seven questions district and school leaders must consider when preparing and disseminating assessment information to teachers:

1. How familiar are teachers with the types of assessment being administered?
2. Do teachers understand the purpose of each assessment?
3. How relevant is the assessment and assessment information to teachers?
4. When data are disseminated to teachers, what characteristics of the data are simple and which are complex?
5. Do the assessment information offer depth and complexity so teachers can analyze the data in more complex ways?
6. Does the data tell a convincing story that will compel teachers to examine their own classroom instruction practices?

Sustain the Work through Professional Learning Communities

The need for collaboration is not new. The work done by DuFour et al. (2006) on professional learning communities suggest that quality professional learning communities are not only data-driven, but also offer teachers collaboration, depth in learning, mutual accountability and interdependence of all participants, and relevance to classroom application. Moreover, an essential component of professional learning communities involve teachers working in "data teams," creating, gathering, and interpreting assessments, while establishing and monitoring S.M.A.R.T. goals to enhance student learning and teaching.

Indeed, Professional Learning Communities are another vital component in school efforts to reform and improve education. But as long as we continue to have teachers collaborate in the absence of data, we will miss out on the powerful effects that professional learning communities have on data-driven instructional decision making.

Data-driven professional learning communities represent a key foundation for effective schools, particularly when schools build a shared knowledge base, create common formative assessments, and align curriculum, instruction, and assessment.

If common formative assessments are the key outcome for Professional Learning Communities, do schools have a systematic process for creating common formative assessments? More importantly, do schools understand the purpose and role of common formative assessments? If so, what methods are used to analyze common formative assessments? School leaders and teachers need to utilize and understand how the use of various methods of analyzing the data, particularly, disaggregating the data by Adequate Yearly Progress (AYP) subgroups can lead to improved student achievement. It appears that every fall, administrators gather classroom teachers together to review and analyze state standardized testing data. While these assessments are necessary for accountability, they soon become “lagging indicators” as the school year progresses, no longer representing timely and relevant data. On the other hand, formative assessments represent timely, accurate, relevant data and are administered more frequently throughout the year so teachers can make informed decisions about teaching and learning. This information provides schools with credible evidence of student learning (Ainsworth & Viegut, 2006). This credible evidence convinces teachers to want to make sense of data and use the data to inform instruction throughout the year.

RECOMMENDATIONS FOR FUTURE RESEARCH

To further investigate data-driven decision making in schools, recommendations for future research include the need for additional qualitative and quantitative research designs. Further qualitative designs can include the use of multiple schools as a phenomenological study or a cross-case analysis of schools who use data and schools who do not use data. Moreover, qualitative designs can explore assessment and data analysis training. Quantitative designs can include correlation studies investigating the effects of assessment and data analysis training or professional learning communities or common formative assessments on student achievement. This study did not seek to answer such questions. Rather, it was meant to explore and provide a rich description of how teachers make data-driven decisions about literacy instruction.

FINAL REMARKS

Decision-making does in fact lead to change. It has become clear that schools need to support data use by building teacher capacity in assessment and data analysis and by establishing data-driven decision making teams to improve teacher practice and student learning in order for remarkable teaching and learning to occur (Guskey, 2007; Stiggins et al., 1986). Instructional decision making in the absence of data will result in little guidance for school leaders and classroom teachers using student assessment information to inform instruction. Failure to make instructional changes based on data can lead to big problems. One last question remains for districts and school leaders who proclaim to be data-driven – How much do you know about how your teachers make sense of data and use the data to inform instruction?

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APPENDIX A
RECRUITMENT MATERIALS

Consent Statement

University of San Diego-San Diego State University
Research Study Overview

Purpose of the Study: The purpose of this study will be to discover the ways in which teachers at the elementary level use multiple types of literacy data and investigate the types of decisions teachers make with the data to accelerate student achievement in literacy.

Number of Participants: The number of participants being recruited for this study is 27 general education teachers. Of the 27, six teachers will be the focus of this study. They will participate in interviews and videotaping.

Description of the Procedures: Phases of data collection will include different ways for collecting information about what teachers do with literacy data. Surveys, interviewing, videotaping, and a review of school documents will be looked at.

Risks or Discomforts: Potential risks include discomfort when being placed into a simulation environment. You might have feelings of uncertainty when trying to talk about what to do with the student assessment information given to you during the interviews. However, the assessment information are fictitious or fake case reports of students and scenarios at the elementary level. The researcher in this study is also the site-based literacy resource teacher so this may make some uncomfortable and not want to participate openly and honestly.

Benefits: Potential benefits include participants becoming more proficient in what to do with student assessment information. Moreover, this study will contribute to the field of teacher decision making in literacy by investigating how teachers use data for instructional purposes and improved student performance. This study will also increase our understanding of data-driven decision making practices by elementary classroom teachers. However, I cannot *guarantee* that any participant will receive any benefit from participating in this study.

Confidentiality: In order to protect your confidentiality, the data for this study that contains names will be stored on my personal, password-protected computer at my home location. Video images will be collected. However, all images will not be used for purposes outside of the study. Upon completion of the study, the data will be kept in a locked file cabinet by me, the researcher, for three years as required by state law. Recordings and actual transcriptions of interviews and grade level meetings will also be kept in the same locked file cabinet. The researcher will be the primary one who has access to this information. In addition, the researcher's university chair and committee members may also see the data during discussions of how to report the information collected from participants.

Teachers who are selected to participate for the interviews be given a pseudonym so their real identify will not be revealed. The master list will be kept in a locked file cabinet. At the end of the three-year period, all data will be destroyed through a paper shredding process. Before any publication, all subjects involved will be invited to review the transcripts and data at any time. Federal regulations require that the Institutional Review Board (IRB) periodically review all approved and continuing projects that involve human subjects. To ensure that your rights as a subject are being protected in this study, it is possible that representatives of the Institutional Review Board may come to this research site to inspect study records.

Incentives to Participate: Because all of the research collected for this study will be during school time and after school, participants will not receive compensation. Teachers will not be paid to participate in any aspect of this study.

Voluntary Nature of Participation: Participation in this study is voluntary. Your choice of whether or not to participate will not influence your future relations with San Diego State University or The San Diego Unified School District. If you decide to participate, you are free to withdraw your consent and to stop your participation at any time without penalty or loss of benefits to which you are allowed.

Questions about the Study: If you have any questions about the research now, please ask. If you have questions later about the research, you may contact myself, Cheryl Pham, at 619-469-6111 or via email at cpham@sandi.net. If you have any questions about your rights as a participant in this study, you may contact the Institutional Review Board at San Diego State University (telephone: 619-594-6622); email: irb@mail.sdsu.edu.

You are being asked to participate in a research study. Please read the following and ask questions as necessary.

Investigator	Affiliated College	Title
Cheryl Pham	San Diego State University University of San Diego	Doctoral candidate
Dr. Barbara Moss	San Diego State University	Professor of Education

You will be asked to do the following:

- Complete a web-based survey
- Participate in videotapings of your grade level's PLC

If you are selected as a focus participant (two from grades 1, 3, 5), you will be asked to complete following additional tasks:

- Participate in structured interviewing three times
- Record thought-processes via audiotape while analyzing student data in literacy
- Participate in member checking that requires you to review your transcribed audiotape interviews to ensure accuracy
- Participate in videotapings of your grade level's PLC

Participation in this study is voluntary. Your choice of whether or not to participate will not influence your relations with the San Diego Unified School District. If you decide to participate, you are free to withdraw your consent and to stop your participation at any time without penalty or loss of benefits to which you are allowed.

Attached to this letter, you will find an explanation of the study including the purpose, number of participants, description of the procedures, risk and benefits, confidentiality, and additional information regarding how to contact members of the Internal Review Board at San Diego State University if you desire to at any time during the study. After reviewing the attachment, please indicate below whether or not you give consent to participate in the study.

Your signature below indicates that you have read the information in this document, have had a chance to ask any questions that you have about the study, and that you agree to participate in the study and have been told that you can change your mind and withdraw consent to participate at any time. You have been given a copy of this consent form. You have been told that by signing this consent form you are not giving up your legal rights. Thank you very much for your time.

Cheryl Pham
 Doctoral Student, Literacy
 University of San Diego – San Diego State University

Participant Recruitment Letter

First Name (please print)

Last Name (please print)

I certify that I have read the attached information requesting my participation in Mrs. Cheryl Pham's research study. I understand that by choosing to participate in this study, I can withdraw at any time. Please check one of the following options that you grant permission for below. Thank you.

- ☐ I agree to participate in the study as a Phase I participant in which I will complete a web-based survey and participate in the videotaping of my grade level PLC data team meetings.
- ☐ I agree to participate in the study as a Phase II participant. If selected during this phase, I will complete the survey plus record my thoughts into a tape recorder while I analyze assessment data and participate in structured interviews twice and participate in member checking and videotaping of my grade level PLCs. **I understand that if I agree to participate in Phase II, I may not be selected due to the small number of participants needed.**

Signature of Participant

Date

Signature of Investigator

Date

APPENDIX B**INTRODUCTORY PAGE TO SURVEY**

Dear Colleague,

Thank you for your participation in my study. Your responses will provide valuable information to district and schools using student assessment information to inform instruction and to better serve students at every level.

The purpose of this study will be to investigate the types of decisions teachers make with literacy data to accelerate student achievement.

The survey you are about to take consists of five parts. Part I includes demographic information such as years of teaching experience, etc. Parts II and III asks questions regarding the types and frequencies of student assessments and data analysis use in your classroom. Part IV asks questions directly related to teachers' knowledge of educational assessment of students. Part V includes two student scenarios of typical struggling readers and asks for an open-ended response.

The survey should take approximately 30 minutes to complete. Your responses are completely confidential and secure. You may exit the survey at any time if you no longer feel like participating.

Sincerely,

Cheryl Pham
Doctoral Student, Literacy
University of San Diego – San Diego State University

APPENDIX C

SURVEY ON TEACHERS' USE OF LITERACY

ASSESSMENT DATA

Teachers' Use of Literacy Assessment Data

1. WELCOME

Please take a few minutes to fill out this survey on the use of student assessment data. The purpose of this survey is to learn about the ways teachers use literacy assessment data to improve student achievement. Thank you for your participation. Your responses are confidential.

Teachers' Use of Literacy Assessment Data**2. Demographic Information**

*** 1. Indicate your classroom room number.**

2. What grade do you currently teach?

- ☐ Kindergarten
- ☐ First Grade
- ☐ Second Grade
- ☐ Third Grade
- ☐ Fourth Grade
- ☐ Fifth Grade

3. How many years have you been teaching?

- ☐ Fewer than 5 years
- ☐ 6-10 years
- ☐ 11-15 years
- ☐ More than 15 years

4. What is your highest degree attained?

- ☐ Bachelors
- ☐ Masters
- ☐ Doctorate

Teachers' Use of Literacy Assessment Data

3. Type of Student Literacy Assessments Administered

1. How often do you administer the following assessments in your classroom?

	Weekly	Monthly	Quarterly	Annually	Never
Running records	☐	☐	☐	☐	☐
Miscue analysis	☐	☐	☐	☐	☐
Word lists	☐	☐	☐	☐	☐
Letter identification	☐	☐	☐	☐	☐
Phonemic Awareness	☐	☐	☐	☐	☐
Fluency	☐	☐	☐	☐	☐
Retelling	☐	☐	☐	☐	☐
Teacher-generated literacy assessment	☐	☐	☐	☐	☐
Grade-level generated literacy assessment	☐	☐	☐	☐	☐

2. How often do you use the following methods to analyze State Standardized Literacy Data for a GROUP of students?

	At least weekly	At least monthly	At least quarterly (every 9 weeks)	Annually	Never
Examine the class average	☐	☐	☐	☐	☐
Do an item analysis to identify strongest and weakest areas of CA Reading/Language Arts standards	☐	☐	☐	☐	☐
Look at the range of scores	☐	☐	☐	☐	☐
Look at overall literacy performance disaggregated by AYP subgroups	☐	☐	☐	☐	☐
Look at overall literacy performance disaggregated by performance level such as Advanced, Proficient, Basic, Below Basic, Far Below Basic	☐	☐	☐	☐	☐
Look at overall literacy performance disaggregated by CA Reading/Language Arts standards (Reading Comprehension, Response to Literature, Word Analysis, Written Conventions, Writing Strategies)	☐	☐	☐	☐	☐
Identify students with common areas of skill needs in literacy	☐	☐	☐	☐	☐

Teachers' Use of Literacy Assessment Data

3. How often do you use the following methods to analyze District Literacy Benchmark Data for a GROUP of students?

	At least weekly	At least monthly	At least quarterly (every 9 weeks)	Annually	Never
Examine the class average	☐	☐	☐	☐	☐
Do an item analysis to identify strongest and weakest areas of CA Reading/Language Arts standards	☐	☐	☐	☐	☐
Look at the range of scores	☐	☐	☐	☐	☐
Look at overall literacy performance disaggregated by AYP subgroups	☐	☐	☐	☐	☐
Look at overall literacy performance disaggregated by performance level such as Advanced, Proficient, Basic, Below Basic, Far Below Basic	☐	☐	☐	☐	☐
Look at overall literacy performance disaggregated by CA Reading/Language Arts standards (Reading Comprehension, Response to Literature, Word Analysis, Written Conventions, Writing Strategies)	☐	☐	☐	☐	☐
Identify students with common areas of skill needs in literacy	☐	☐	☐	☐	☐

4. How often do you use the following methods to analyze Instructional Reading Level Data for a GROUP of students?

	At least weekly	At least monthly	At least quarterly (every 9 weeks)	Annually	Never
Look at the range of scores	☐	☐	☐	☐	☐
Look at overall reading performance disaggregated by AYP subgroups	☐	☐	☐	☐	☐
Look at overall reading performance aggregated by targeted reading goals or benchmarks	☐	☐	☐	☐	☐
Identify students with common areas of skill needs in reading	☐	☐	☐	☐	☐

Teachers' Use of Literacy Assessment Data

5. How often do you use the following methods to analyze Grade Level Created Literacy Assessment Data (Common Assessments) for a GROUP of students?

	At least weekly	At least monthly	At least quarterly (every 9 weeks)	Annually	Never
Examine the class average	☐	☐	☐	☐	☐
Do an item analysis to identify strongest and weakest areas of CA Reading/Language Arts standards	☐	☐	☐	☐	☐
Look at the range of scores	☐	☐	☐	☐	☐
Look at overall literacy performance disaggregated by AYP subgroups	☐	☐	☐	☐	☐
Look at overall literacy performance disaggregated by performance level such as Advanced, Proficient, Basic, Below Basic, Far Below Basic	☐	☐	☐	☐	☐
Look at overall literacy performance disaggregated by CA Reading/Language Arts standards (Reading Comprehension, Response to Literature, Word Analysis, Written Conventions, Writing Strategies)	☐	☐	☐	☐	☐
Identify students with common areas of skill needs in literacy	☐	☐	☐	☐	☐

Teachers' Use of Literacy Assessment Data

6. How often do you use the following methods to analyze Literacy Data for INDIVIDUAL students?

	At least weekly	At least monthly	At least quarterly (every 9 weeks)	Annually	Never
Look at overall student literacy performance disaggregated by CA Reading/Language Arts standards	☐	☐	☐	☐	☐
Look at overall literacy performance disaggregated by performance level such as Advanced, Proficient, Basic, Below Basic, Far Below Basic	☐	☐	☐	☐	☐
Look at student literacy scores question by question (item analysis)	☐	☐	☐	☐	☐
Look at overall reading performance and compare against targeted reading goals or benchmarks	☐	☐	☐	☐	☐
Compare pre-and post-test data	☐	☐	☐	☐	☐
Look at miscue data for patterns	☐	☐	☐	☐	☐
Look at fluency data and compare against grade level fluency norms	☐	☐	☐	☐	☐
Look at reading comprehension scores or skills (inferential or literal understanding)	☐	☐	☐	☐	☐
Look at retelling data	☐	☐	☐	☐	☐

Teachers' Use of Literacy Assessment Data

4. Changes in Instruction for a GROUP

1. I have made the following changes to my instructional practice based on student literacy assessment data:

	Yes	No
Provide more direct, explicit instruction for a specific literacy strategy or skill	☐	☐
Change the pacing of future literacy instruction	☐	☐
Regroup students within the classroom for specific literacy skills or strategy instruction	☐	☐
Regroup students within the grade level for specific literacy skills or strategy instruction	☐	☐
Differentiate instruction based on student strengths and areas of need to provide intervention or enrichment	☐	☐
Scaffold instruction	☐	☐
Provide more guided practice with specific literacy skills or strategies	☐	☐
Provide timely, specific feedback related to specific literacy skills or strategies	☐	☐
Use graphic organizers to support literacy instruction	☐	☐
Build background knowledge to frontload literacy instruction	☐	☐
Provide students with leveled books appropriate to students' instructional or independent reading level	☐	☐
Increase the use of shared reading	☐	☐
Increase the use of read aloud	☐	☐
Increase more opportunities for independent practice with literacy skills or strategies previously taught	☐	☐

Other (please specify)

Teachers' Use of Literacy Assessment Data

5. Changes in Instruction for INDIVIDUAL STUDENTS

1. I have made the following changes to my instructional practice based on student literacy assessment data:

	Yes	No
Provide more direct, explicit instruction for a specific literacy strategy or skill	☐	☐
Change the pacing of future literacy instruction	☐	☐
Regroup students within the classroom for specific literacy skills or strategy instruction	☐	☐
Regroup students within the grade level for specific literacy skills or strategy instruction	☐	☐
Differentiate instruction based on student strengths and areas of need to provide intervention or enrichment	☐	☐
Scaffold instruction	☐	☐
Provide more guided practice with specific literacy skills or strategies	☐	☐
Provide timely, specific feedback related to specific literacy skills or strategies	☐	☐
Use graphic organizers to support literacy instruction	☐	☐
Build background knowledge to frontload literacy instruction	☐	☐
Provide students with leveled books appropriate to students' instructional or independent reading level	☐	☐
Provide more small group instruction	☐	☐
Increase more opportunities for independent practice with literacy skills or strategies previously taught	☐	☐
Other (please specify)		

Teachers' Use of Literacy Assessment Data

6. Assessment

Please read each item carefully and select the responses you think are the best ones. If you think you know which is best, even if you are not positive, mark that response.

1. Please rate the following assessments in order of importance.

	Extremely important	Important	Doesn't matter much	Least important
Standardized assessments	☐	☐	☐	☐
District Benchmark assessments	☐	☐	☐	☐
Teacher-created assessments	☐	☐	☐	☐
Running records	☐	☐	☐	☐

Why do you value this type of assessment?

2. What factor do you consider most important when choosing a method for assessing student reading performance?

- ☐ Ease of preparing and administering the assessment
- ☐ Ease of scoring the assessment
- ☐ Alignment with instructional objectives
- ☐ Type of diagnostic information provided by the assessment

3. Mrs. Bruce wishes to assess her students' understanding of identifying the main idea of a nonfiction passage that she has been teaching. Which assessment strategy would you be most likely to use if you were Mrs. Bruce?

- ☐ Select a textbook that has a "teacher's guide" with a test developed by the authors.
- ☐ Develop an assessment consistent with what was actually taught in the class.
- ☐ Select a standardized test that provides a score on identifying the main idea.
- ☐ Select an instrument that measures students' attitudes about finding the main idea.

Briefly provide an explanation

Teachers' Use of Literacy Assessment Data

4. A teacher wants to document the validity of the scores from a classroom assessment strategy she plans to use for assigning grades on a class unit. What kind of information would provide the best evidence for this purpose?

- ☐ Have other teachers judge whether the assessment strategy covers what was taught.
- ☐ Match an outline of the instructional content to the content of the assessment strategy.
- ☐ Let the students in the class indicate if they thought the assessment was valid.
- ☐ Ask parents if the assessment reflects important learning outcomes.

5. At the close of the first month of school, Mrs. Friend gives her fifth grade students a test she developed on comparing and contrasting folktales. Her test is modeled after a standardized reading comprehension test. It presents passages and then asks questions related to comparing and contrasting. When the test was scored, she noticed that two of her students who had been performing well in the class, scored a lot lower than other students. Of the following types of additional information, which would be most helpful in interpreting the results of this test?

- ☐ The gender of the students.
- ☐ The age of the students.
- ☐ Reliability data for the standardized reading comprehension test she used as the model.
- ☐ Reading comprehension scores for the students.

6. Frank, a beginning fourth grader, received a G.E. (grade equivalent score) of 3.0 on the Reading Comprehension subtest of a standardized test. This score should be interpreted to mean that Frank:

- ☐ Can read and understand 3rd grade reading level material.
- ☐ Scored as well as a typical beginning 3rd grader scored on this test.
- ☐ Is performing in Reading Comprehension at the 3rd grade level
- ☐ Will probably reach maximum performance in Reading Comprehension at the beginning of the 3rd grade

Teachers' Use of Literacy Assessment Data

7. Ms. Camp is starting a new unit on nonfiction with her 3rd grade class. Before beginning the unit, she gives her students a test on identifying the text features and structures of nonfiction. Which of the following is the most likely reason she gives this test to her students?

- ☐ The teacher needs to report the results of this assessment to the principal.
- ☐ Ms. Camp wants to give the students practice in taking tests early in the school year.
- ☐ Ms. Camp wants to report the results of this assessment to the students.
- ☐ Ms. Camp wants to measure growth in student achievement of these concepts, and scores on this test serve as the students' knowledge of baseline.

Teachers' Use of Literacy Assessment Data

7. Student Scenarios

The following scenarios describe two readers. Scenario A describes Ethan, a first grader. Scenario B describes Denise, a fifth grader. Select ONE scenario based on your grade level experience or preference. After reading your selected scenario, please respond to the prompt.

1. SCENARIO A:

Ethan entered first grade without having attended kindergarten and with very limited literacy experiences in concepts about print. Based on the District's WRAP Literacy Essentials data, he recognizes all letters of the alphabet and can identify the sounds for each letter. His high frequency word inventory assessment shows that he was knowledge of 25 high frequency words. Based on a teacher-created assessment on segmenting and blending CVC words, Ethan can easily segment sounds, but has trouble blending sounds together to read words.

What instructional recommendation(s) would you give for helping Ethan blend sounds together?

2. SCENARIO B:

Results from the 3rd grade STAR California Standardized Test shows that Denise entered fourth grade Proficient in English Language Arts. She scored 55% correct in Word Analysis with 11/22 questions answered correctly and 73% correct in Reading Comprehension with 11/15 questions answered correctly. Her teacher's anecdotal records from Guided Reading show that Denise enjoys reading and can read multisyllabic words. On a recent running record taken of Denise reading a grade level fictional passage, Denise's comprehension data showed that she was comprehending at the literal level.

What instructional recommendation(s) would you give for helping Denise with reading comprehension?

Teachers' Use of Literacy Assessment Data

8. YOU ARE DONE!

Thank you for your participation. Your responses are confidential.

APPENDIX D

MOCK INTERVIEW PROTOCOL AND INDIVIDUAL STUDENT CASE REPORT

Participant's Identification: _____

Date: _____

Grade _____

Goals of Research:

The purpose of this study will be to describe the ways in which teachers at the elementary level use multiple types of literacy data and investigate the types of decisions teachers make with the data to accelerate student achievement.

Process Tracing Approach:

The method used to obtain data for this study on teachers' data-driven instructional decision-making is called "process tracing." You will be presented with fictitious student case reports containing multiple literacy assessment data. You will be required to "think aloud" or verbally provide a detailed account as you analyze the data.

Introduction:

- ✓ Introduce yourself, the purpose of the study, and the method used for the interview.
- ✓ Explain that the interview will be digitally recorded, but will remain confidential.
- ✓ Let them know that this is the mock report so participants can become familiar with the process tracing approach.

For this part of the interview, you will be asked to "think aloud" or verbally provide a detailed account as you analyze literacy assessment data. To assist you in the process, I may ask you probing questions to facilitate your analysis. Choose a case report based on your grade level experience and provide a verbal account as you analyze the data.

Prompts & Probing Questions:

- Keep talking
- What are you thinking or feeling at this point?
- What other alternatives were you considering?
- Do you have anything more you want to say about this student? (This question will be repeated until the teacher answers in the negative.)

Mock Case Report Primary

I am going to the beach
I am running to the
beach because I want
to get in the water
but the water is too
cold and ice like a
ice cream I get in
the water and splashed
the water.

Mock Case Report Upper

Mr

Recycling glass is an excellent idea because it helps the environment. As a result of recycling glass we save more energy. Since we recycle glass we get more cash. When we recycle glass there are changes to help our earth. Due to recycling glass less animals lose their habitat. Since we recycle glass we don't have to dig up more materials. Recycling glass is a great idea because it saves our earth's resources.

APPENDIX E

PROCESS TRACING INTERVIEW PROTOCOL

Participant's Identification: _____

Date: _____

Grade _____

Goals of Research:

The purpose of this study will be to describe the ways in which teachers at the elementary level use multiple types of literacy data and investigate the types of decisions teachers make with the data to accelerate student achievement.

Process Tracing Approach:

The method used to obtain data for this study on teachers' data-driven instructional decision-making is called "process tracing." You will be presented with fictitious student case reports containing multiple literacy assessment data. You will be required to "think aloud" or verbally provide a detailed account as you analyze the data.

Introduction:

- ✓ Introduce yourself, the purpose of the study, and the method used for the interview.
- ✓ Explain that the interview will be digitally recorded, but will remain confidential.
- ✓ Let them know that the interview will take approximately 45 minutes and ask if there are any questions before beginning.

Procedures for Conducting the Interview

PART 1 Interview Questions

Researcher says:

There will be two parts to this interview. For this part of the interview, you will be asked questions about your own classroom experiences related to literacy as a result of analyzing literacy data. Please state your name, the grade you teach, and today's date

Session 1 Interview Questions with Case Reports #1-3

1. What do you think the role of assessment should be in literacy instruction?
2. What ways does assessment influence your literacy instruction?
3. Describe for me some of the literacy assessments you use in your classroom?
 - a. Why do you value these types of assessments?
 - b. What kinds of information do they provide you?
4. Can you give me an example of how literacy data has been used in your classroom to design instruction for a group of students?
5. Tell me about a time when your instruction has changed as a result of literacy assessment data for a group of students?
 - a. What data sources did you use?
 - b. What did you do to analyze the data?
 - c. How did your instruction change?
 - d. Was the change in instruction effective? Why or why not?

Session 2 Interview Questions with Case Reports # 4 and #5

1. Tell me about your experience with learning how to analyze literacy data for an individual student?
 - a. Did you receive any type of training?
 - b. If so, what type of training did you receive? Did the district or your school provide it?
2. Can you give me an example of how literacy data has been used in your classroom to design instruction for an individual student?
 - a. What literacy data did you use?

Session 3 Interview Questions with Case Reports # 6 and #7

1. What do you think the role of running records should be in literacy instruction?
2. Tell me about a struggling reader whose performance improved through the use of data-driven instruction?
 - a. What was the intervention?
 - b. What data did you use to monitor his/her performance?
3. Can you give me an example of when you have used a running record in your classroom to design instruction for an individual student?

Part 2 Case Reports

Researcher says:

Now, I would like to move on to the second part of this interview. For this part of the interview, you will be asked to “think aloud” or verbally provide a detailed account as you analyze literacy assessment data. To assist you in the process, I may ask you probing questions to facilitate your analysis.

Session 1 with Case Reports #1-3

Researcher says:

Now I would like to show you three different data sources for a group of students. One is a Literacy Benchmark Summary Report, the other a Houghton Mifflin Summative Assessment Report, and the other is a grade level reading summary report of students’ Fountas and Pinnell independent reading levels and recommendations for reading strategies and behaviors instruction.

Questions:

1. Which of these would you most likely use?
2. Why did you pick it?
3. Describe for me a small group lesson that you might do as a result of the data you selected.

Probing Questions:

1. Would you be more specific?

Sessions 2-3 with Case Reports # 4, 5, 6, 7

Choose a case report based on your grade level experience and provide a verbal account as you analyze the data.

Prompts & Probing Questions:

- Keep talking
- What are you thinking or feeling at this point?
- What other alternatives were you considering?
- Do you have anything more you want to say about this student? (This question will be repeated until the teacher answers in the negative.)

Conclusion:

- ✓ Thank the participant for their cooperation and time.
- ✓ Let them know that you may need to contact them for follow-ups.

Document Request:

- ✓ School Data Analysis Protocols
- ✓ Work samples to demonstrate data use
- ✓ PLC data team meeting agendas

APPENDIX F

CASE REPORT # 1

DISTRICT LITERACY BENCHMARK SUMMARY

REPORT

Student ID	# Points	% Points	LA.1.RW.1.1.17 (1)	LA.1.RW.1.1.14 (1)	LA.1.WC.1.1.8 (1)	LA.1.WC.1.1.1 (1)	LA.1.WC.1.1.7 (1)	LA.1.WC.1.1.4 (1)	LA.1.WC.1.1.3 (1)
1111111			1	1		1	1		1
1111111			1	1		1	1		1
88380	16	80%	100%	100%	100%	100%	100%	100%	100%
317359	15	75%	0%	100%	0%	100%	0%	0%	100%
302268	11	55%	0%	100%	100%	0%	0%	100%	100%
322936	14	70%	0%	0%	100%	100%	0%	100%	100%
320262	20	100%	100%	100%	100%	100%	100%	100%	100%
356200	17	85%	100%	100%	100%	100%	0%	0%	100%
310833	19	95%	100%	100%	100%	100%	100%	100%	100%
307018	12	60%	0%	100%	0%	100%	100%	100%	100%
84879	16	80%	0%	100%	100%	100%	100%	100%	100%
347587	18	90%	100%	100%	100%	100%	100%	100%	100%
325452	15	75%	0%	100%	100%	100%	100%	100%	100%
67868	9	45%	0%	100%	0%	100%	0%	0%	100%
43440	10	50%	0%	0%	100%	0%	0%	0%	0%
327269	16	80%	100%	100%	0%	0%	100%	100%	100%
85486	18	90%	100%	100%	100%	100%	100%	100%	100%
85482	16	80%	100%	100%	100%	100%	0%	100%	100%
Average	15.13	75.63%	50%	87.5%	75%	81.25%	56.25%	75%	93.75%

Student ID	# Points	% Points	LA.1.RL.3.3.1 (1)	LA.1.RL.3.3.2 (1)	LA.1.WS.1.1.1 (1)	LA.1.WS.1.1.2 (1)	Reading Comp.	Word Analysis	Written Conventions
1111111			1	1	1	1	1	1	1
1111111			1	1	1	1	1	1	1
88380	16	80%	50%	0%	100%	0%	100%	80%	100%
317359	15	75%	50%	100%	100%	100%	100%	80%	40%
302268	11	55%	50%	100%	0%	100%	75%	40%	60%
322936	14	70%	50%	100%	100%	100%	75%	40%	80%
320262	20	100%	100%	100%	100%	100%	100%	100%	100%
356200	17	85%	100%	100%	100%	0%	100%	100%	60%
310833	19	95%	50%	100%	100%	100%	100%	100%	100%
307018	12	60%	50%	0%	100%	100%	50%	40%	80%
84879	16	80%	100%	100%	100%	100%	75%	40%	100%
347587	18	90%	100%	100%	100%	100%	100%	60%	100%
325452	15	75%	50%	0%	50%	100%	75%	80%	100%
67868	9	45%	50%	0%	0%	100%	50%	60%	40%

Student ID	# Points	% Points	LA.1.RL.3.1 (1)	LA.1.RL.3.2 (1)	LA.1.WS.1.1.1 (1)	LA.1.WS.1.1.2 (1)	Reading Comp.	Word Analysis	Written Conventions
Total									
Total Points	2	100%	2	1	2	1	1	1	1
43440	10	50%	50%	100%	100%	0%	75%	40%	20%
327269	16	80%	0%	100%	100%	100%	100%	100%	60%
85486	18	90%	50%	100%	50%	100%	100%	100%	100%
85482	16	80%	50%	0%	50%	100%	100%	100%	80%
Average	15.13	75.63%	59.38%	68.75%	78.13%	81.25%	85.94%	72.5%	76.25%

Student ID	# Points	% Points	Response to Lit.	Writing Strategies
Total				
Total Points	2	100%	1	1
88380	16	80%	33.33%	66.67%
317359	15	75%	66.67%	100%
302268	11	55%	66.67%	33.33%
322936	14	70%	66.67%	100%
320262	20	100%	100%	100%
356200	17	85%	100%	66.67%
310833	19	95%	66.67%	100%
307018	12	60%	33.33%	100%
84879	16	80%	100%	100%
347587	18	90%	100%	100%
325452	15	75%	33.33%	66.67%
67868	9	45%	33.33%	33.33%
43440	10	50%	66.67%	66.67%
327269	16	80%	33.33%	100%
85486	18	90%	66.67%	66.67%
85482	16	80%	33.33%	66.67%
Average	15.13	75.63%	62.5%	79.17%

APPENDIX G

CASE REPORT #2

HOUGHTON MIFFLIN SUMMATIVE REPORT

HM California Summative Data					Advanced (A)		35 - 40 (87% - 100%)	
					Proficient (P)		30 - 34 (75% - 86%)	
					Basic (B)		26 - 29 (65% - 74%)	
					Below Basic (BB)		24 - 25 (60% - 64%)	
					Far Below Basic (FBB)		0 - 23 (0% - 59%)	
Teacher:			Grade: 1		2009-10 Q1			
First	Last	Concepts of Print (4)	Phonemic Awareness (12)	Decoding and Word Recognition (12)	Vocabulary and Concept Development (4)	Reading Comprehension (6)	Listening (2)	Proficiency Level
Robert		4 (100%)	2 (17%)	7 (58%)	4 (100%)	3 (50%)	2 (100%)	22 FBB
Edgar		4 (100%)	4 (33%)	6 (50%)	3 (75%)	4 (67%)	2 (100%)	23 FBB
Irais		4 (100%)	7 (58%)	2 (17%)	2 (50%)	2 (33%)	2 (100%)	19 FBB
Marcos		4 (100%)	5 (42%)	8 (67%)	4 (100%)	5 (83%)	2 (100%)	28 B
Jeremy		4 (100%)	6 (50%)	2 (17%)	4 (100%)	2 (33%)	2 (100%)	20 FBB
Lacie		4 (100%)	7 (58%)	3 (25%)	4 (100%)	4 (67%)	2 (100%)	24 BB
Jeremy		4 (100%)	2 (17%)	2 (17%)	3 (75%)	2 (33%)	2 (100%)	15 FBB
Jose		4 (100%)	5 (42%)	4 (33%)	3 (75%)	1 (17%)	2 (100%)	19 FBB
Kierra		4 (100%)	8 (67%)	4 (33%)	3 (75%)	3 (50%)	2 (100%)	24 BB
Jose		4 (100%)	6 (50%)	5 (42%)	3 (75%)	5 (83%)	2 (100%)	25 BB
Elan		4 (100%)	5 (42%)	2 (17%)	3 (75%)	0 (0%)	2 (100%)	16 FBB
Melany		4 (100%)	5 (42%)	5 (42%)	3 (75%)	4 (67%)	2 (100%)	23 FBB
Steven		4 (100%)	12 (100%)	12 (100%)	4 (100%)	6 (100%)	2 (100%)	40 A
Daveon		4 (100%)	11 (92%)	11 (92%)	4 (100%)	6 (100%)	2 (100%)	38 A
Adela		4 (100%)	12 (100%)	10 (83%)	4 (100%)	5 (83%)	2 (100%)	37 A
Juana		4 (100%)	2 (17%)	4 (33%)	2 (50%)	0 (0%)	2 (100%)	14 FBB

APPENDIX H

CASE REPORT #3

CLASS READING LEVEL REPORT

Monthly Reading Level Assessment for San Diego				
Teacher: Demo Third		Grade: 3		Month: 2006-09-00
First name	Last name	IR Level	GR Level	Instructional Next Steps
Barry	Bonds	⊙	P	<ul style="list-style-type: none"> Recognizing and analyzing bias, propaganda and stereotyping in texts.
Louis	Braille	N	O	<ul style="list-style-type: none"> Identifying that dialogue changes without markers. Understanding that dialogue adds to a character's development. Understanding that dialogue is used in a variety of ways; thought, introduction of a new character, beginning a new incident or chapter.
Wright	Brothers	L	M	<ul style="list-style-type: none"> Understanding how tone, imagery contributes to meaning. Tracking the main events to the climax.
Joe	Caron	J	K	<ul style="list-style-type: none"> Using a variety of word analysis strategies without losing meaning or fluency. Reading in a phrased, fluent way over longer stretches of text.
Charles	Dickenson	H	I	<ul style="list-style-type: none"> Using fluent and phrased reading, especially when rereading. Competent problem solving of new words on initial reading.
Jane	Doe1	N	O	<ul style="list-style-type: none"> Identifying that dialogue changes without markers. Understanding that dialogue adds to a character's development. Understanding that dialogue is used in a variety of ways; thought, introduction of a new character, beginning a new incident or chapter.
John1	Doe1	I	J	<ul style="list-style-type: none"> Solving unfamiliar words or concepts "on the run" without detracting from meaning. Self-correcting when necessary to support meaning, but showing a general forward thrust (checking and self-correcting behaviors become less overt and more internal)
John2	Doe2	I	J	<ul style="list-style-type: none"> Solving unfamiliar words or concepts "on the run" without detracting from meaning. Self-correcting when necessary to support meaning, but showing a general forward thrust (checking and self-correcting behaviors become less overt and more internal)
Gertrude	Elion	J	K	<ul style="list-style-type: none"> Using a variety of word analysis strategies without losing meaning or fluency. Reading in a phrased, fluent way over longer stretches of text.
Jorge	Flankton	I	J	<ul style="list-style-type: none"> Solving unfamiliar words or concepts "on the run" without detracting from meaning. Self-correcting when necessary to support meaning, but showing a general forward thrust (checking and self-correcting behaviors become less overt and more internal)
Henry	Ford	L	M	<ul style="list-style-type: none"> Understanding how tone, imagery contributes to meaning. Tracking the main events to the climax.
Dallas	FortWorth	L	M	<ul style="list-style-type: none"> Understanding how tone, imagery contributes to meaning. Tracking the main events to the climax.
Benjamin	Franklin	I	J	<ul style="list-style-type: none"> Solving unfamiliar words or concepts "on the run" without detracting from meaning. Self-correcting when necessary to support meaning, but showing a general forward thrust (checking and self-correcting behaviors become less overt and more internal)
Elizabeth	Hazen	L	M	<ul style="list-style-type: none"> Understanding how tone, imagery contributes to meaning. Tracking the main events to the climax.
Lisa	Lisa	N	O	<ul style="list-style-type: none"> Identifying that dialogue changes without markers. Understanding that dialogue adds to a character's development. Understanding that dialogue is used in a variety of ways; thought, introduction of a new character, beginning a new incident or chapter.
Henry's	Moat's	H	J	<ul style="list-style-type: none"> Solving unfamiliar words or concepts "on the run" without detracting from meaning. Self-correcting when necessary to support meaning, but showing a general forward thrust (checking and self-correcting behaviors become less overt and more internal)
Garrett	Morgan	L	M	<ul style="list-style-type: none"> Understanding how tone, imagery contributes to meaning. Tracking the main events to the climax.
Julie	Newmar	⊙	P	<ul style="list-style-type: none"> Recognizing and analyzing bias, propaganda and stereotyping in texts.
Julia	Roberts	L	M	<ul style="list-style-type: none"> Understanding how tone, imagery contributes to meaning. Tracking the main events to the climax.

APPENDIX I

CASE REPORT #4

GRADE 2 (PRIMARY) STUDENT

Student Information

Student Name:	Student Primary	Student ID:	12345678
School Name:	School A Elementary School	Grade:	2
Ethnicity:	Hispanic	Gender:	Male

Programs and Interventions

Intervention:	Phonics for Reading Level 1	Target Group:	Reading
CELDT:	Intermediate	Attendance:	70%
GATE:	Not Applicable	Expulsions:	0
Special Education:	Not Receiving Services	Suspensions:	1

California Standards Test

Subject	2010-09		2008-07		2006-05	
	Scale Score	Proficiency Level	Scale Score	Proficiency Level	Scale Score	Proficiency Level
English Language Arts	322	BB	-	-	-	-
Mathematics	350	B	-	-	-	-

California English Language Development Test (CELDT)

Subject	2010-09		2008-07		2006-05	
	Scale Score	Proficiency Level	Scale Score	Proficiency Level	Scale Score	Proficiency Level
Listening	534	Intermediate	437	Early Intermediate	437	Early Intermediate
Speaking	465	Intermediate	448	Early Intermediate	448	Early Intermediate
Reading	506	Intermediate	534	Intermediate	534	Intermediate
Writing	563	Early Advanced	476	Early Intermediate	476	Early Intermediate
Overall	517	Intermediate	473	Early Intermediate	473	Early Intermediate

Academic Achievement

Date	2010-09		2008-07		2006-2005	
	Score	Proficiency Level	Score	Proficiency Level	Score	Proficiency Level
Quarter 1	40	FBB	24	FBB	-	-
Quarter 2	40	FBB	30	B	-	-
Quarter 3	56	P	31	B	-	-

Student Information

Student Name:	Student Primary	Student ID:	12345678
School Name:	School A Elementary School	Grade:	2
Ethnicity:	Hispanic	Gender:	Male

Programs and Interventions

Intervention:	Phonics for Reading Level 1	Target Group:	Reading
CELDT:	Intermediate	Attendance:	70%
GATE:	Not Applicable	Expulsions:	0
Special Education:	Not Receiving Services	Suspensions:	1

Writing and Reading Assessment Profile (WRAP) - Literacy Essentials

Grade	Spring		Winter		Fall	
	Letter Names	Phonemic Awareness	Letter Names	Phonemic Awareness	Letter Names	Phonemic Awareness
Grade 2	28	28	28	28	25	13

Writing and Reading Assessment Profile (WRAP) - English Language Proficiency

Grade	Spring	Winter	Fall
	Number of Words	Number of Words	Number of Words
Grade 2	150	75	34

Instructional Reading Level

Level	Spring	Winter	Fall
Reading Level	J/18	F/10	E/8
Basal Equivalent	First Grade	Pre-Primer	Pre-Primer

Lexia

Grade	Spring		Winter		Fall	
	Percentile	CWPM	Percentile	CWPM	Percentile	CWPM
Grade 1	25	61	25	42	10	11

APPENDIX J

CASE REPORT #5

GRADE 5 (UPPER) STUDENT

Student Information

Student Name	Student Upper	Student ID	0011223344
School Name	School A Elementary School	Grade	5
Ethnicity	Hispanic	Gender	Female

Programs and Interventions

Intervention	REWARDS	Target Group	Reading
CELDT	Early Advanced	Attendance	100%
GATE	No	Expulsions	0
Special Education	Not Receiving Services	Suspensions	0

California Standards Test

Subject	2010-09		2008-07		2006-05	
	Scale Score	Proficiency Level	Scale Score	Proficiency Level	Scale Score	Proficiency Level
English Language Arts	342	Basic	300	Basic	292	Below Basic-
Mathematics	365	Proficient	358	Proficient	335	-Basic
Science	-	-	-	-	-	

California English Language Development Test (CELDT)

Subject	2010-09		2008-07		2006-05	
	Scale Score	Proficiency Level	Scale Score	Proficiency Level	Scale Score	Proficiency Level
Listening	635	Advanced	502	Intermediate	488	Intermediate
Speaking	574	Advanced	550	Advanced	529	Early Advanced
Reading	574	Early Advanced	510	Intermediate	378	Beginning
Writing	520	Intermediate	507	Intermediate	461	Early Intermediate
Overall	575	Early Advanced	517	Intermediate	464	Intermediate

Quarterly Data Summary

Date	2010-09		2008-07		2006-05	
	Score	Proficiency Level	Score	Proficiency Level	Score	Proficiency Level
Quarter 1	36 67%	Below Basic	50%	Basic	51%	Basic
Quarter 2	66 67%	Basic	53%	Basic	-58 6%	Basic
Quarter 3	75%	Basic	55 17%	Basic	-65%	Basic

40,000

Grade	Spring		Winter		Fall	
	<i>Percentile</i>	<i>CWPM</i>	<i>Percentile</i>	<i>CWPM</i>	<i>Percentile</i>	<i>CWPM</i>
Grade 4	50	94	25	68	10	45

APPENDIX K
CASE REPORT #6
GRADE 2 (PRIMARY) STUDENT

Student Information

Student Name	Student Primary	Student ID	12345678
School Name	School A Elementary School	Grade	2
Ethnicity	Hispanic	Gender	Male

Title: Anna's New Glasses
Reading Level F
Type of Text: Fiction

Running Record

Part One: Oral Reading

Page

- 2 "I am ready for school,"
said Anna.
She had a new red backpack
and new shoes.
"We have one more thing to
do," said her mom. "You may
need to get some glasses."
"I don't need glasses!"
said Anna.
"You may need glasses to help
you read," said her mom.
"Do you want to read
at school?"
"I want to read," said Anna.

- "I love books!
But I don't want glasses."
6 Anna went to the doctor.
"You do need glasses,"
said the doctor.
7 Anna looked at the glasses.
8 "I don't like these glasses,"
she said.
9 "Look at the purple glasses,"
said Mom.
Anna put on
the purple glasses.
11 Anna put on some red glasses.
"I like red and I like
these red glasses," she said.
"You look great in those
glasses," said Mom.
12 It was the first day
of school.
Anna put her
new red glasses in
her new red backpack.
13 "Don't forget your glasses,"

- said Mom.
"I put them in my backpack,"
said Anna.
"Put your glasses on at school,"
said Mom.
15 Anna and her mom walked
to school.

Part Two: Comprehension

Student's Score: 1

Comprehension Scoring Key
Fountas & Pinnell 2008

0

Reflects no understanding of the text. Either does not respond or talks off the topic.

1

Reflects very limited understanding of the text. Mentions a few facts or ideas but does not express the important information or ideas.

2

Reflects partial understanding of the text. Includes important information and ideas but neglects other key understandings.

3

Reflects excellent understanding of the text. Includes almost all important information and main ideas.

APPENDIX L

CASE REPORT # 7

GRADE 5 (UPPER) STUDENT

Student Information

Student Name:	Student Upper	Student ID:	0011223344
School Name:	School A Elementary School	Grade	5
Ethnicity	Hispanic	Gender	Female

Title: Saving Up
 Reading Level M
 Type of Text: Fiction

Running Record

Part One: Oral Reading

Page

1 I really, really ^{want} to get a dog.
 But Mom said I ^{wasn't} responsible
 enough to take care of a pet.
 I ^{am} "I'm very responsible!" I said.
 "Hmm. Okay, Mr. Responsible. I
^{hate to} disagree with you, Danny.
 But how many times did I tell you to
 Clean your room this week?" asked
 Mom.
 "Well, cleaning my room is ^{so} totally
 boring! Taking care of a dog would

- ✓ ^{cc} ~~total~~ ✓
be totally fun! "
- ✓ ✓ ✓ ✓ ✓ ✓ ✓
Mom said, "Dogs are a lot of
✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓
work!" She said I'd have to prove I
✓ ✓ ✓ ✓ ✓ ✓ ✓
2 was responsible enough to get a dog.
✓ ✓ ✓ ^{you} ✓ ✓ ✓
"Great! How can I prove I'm
✓ ± ✓ ✓
responsible? I'll do anything!"
✓ ✓ ^{would} ✓ ✓ ✓
"First, you should call the animal
✓ ✓ ✓ ✓ ✓ ✓ ✓
shelter and ask them how much it
✓ ✓ ✓ ✓ ✓ ✓ ✓
costs to get a dog. Then you'll have
✓ ✓ ✓ ✓
to save the money."
✓ ✓ ^{correctly} ✓ ✓ ✓ ✓
"I can certainly do that!" I said.
✓ ✓ ✓ ✓ ✓ ✓ ✓
I called the shelter. I found out ^{lit}
✓ ✓ ✓ ✓ ✓ ✓ ^R ✓
costs one hundred and forty dollars
✓ ✓ ✓ ✓ ✓ ✓ ✓
to get a puppy and seventy dollars
✓ ✓ ✓ ✓ ✓ ✓ ✓
to get a dog. I decided to get a
✓ ✓
grown dog!
✓ ✓ ✓ ✓ ✓ ✓ ✓
How long would it take me to
✓ ✓ ✓ ✓ ✓ ✓ ✓
save seventy dollars? I started to do
✓ ✓
the math.
✓ ✓ ✓ ✓ ✓ ✓ ✓
3 My allowance was seven dollars a
✓ ✓ ✓ ✓ ✓ ✓ ✓
week, if I did all my chores. I never
✓ ✓ ✓ ✓ ✓ ✓ ± ✓
used to save any of it. Now I'd have
✓ ✓ ✓ ✓ ✓
to save a whole lot

Part Two: Comprehension

Student's Score: 2

Comprehension Scoring Key
Fountas & Pinnell 2008

0

Reflects no understanding of the text. Either does not respond or talks off the topic.

1

Reflects very limited understanding of the text. Mentions a few facts or ideas but does not express the important information or ideas.

2

Reflects partial understanding of the text. Includes important information and ideas but neglects other key understandings.

3

Reflects excellent understanding of the text. Includes almost all important information and main ideas.

APPENDIX M

PERMISSIONS FOR FIGURES AND SURVEY

INSTRUMENT

Teacher Assessment Literacy Questionnaire

Barbara Plake <bplake@unlserve.unl.edu>
To: cheryl pham <

Mon, Apr 26, 2010 at 9:57 AM

Thank you for your request to use the Teacher Assessment Literacy instrument for your research. I do not own copyright on the instruments, NCME does. However, NCME has authorized use of the instrument for research purposes. I am attaching three files. The first file has the full instrument, plus some background questions that we used for the research study you referenced. The second file has the 35-item Teacher Assessment Literacy Assessment without the background question. The third file is the key for the test.

I hope you will find these materials useful for your research.

Barbara Plake

[Quoted text hidden]

[Quoted text hidden]

--

Barbara Plake, Ph.D.
Professor Emeritus
University of Nebraska-Lincoln
PO Box 4658
Buena Vista, CO 81211
[719-395-0478](tel:719-395-0478) (voice)
[719-395-0479](tel:719-395-0479) (fax)
[719-221-5196](tel:719-221-5196) (cell)

3 attachments

Tcher Assmt Literacy 1&2.doc
52K

Tcher Assess Literacy Par.doc
47K

KEY Literacy test.doc
1K

APPENDIX N

IRB EXEMPT LETTER

Graduate and Research Affairs
 Division of Research Affairs
 San Diego State University
 5500 Campanile Drive
 San Diego CA 92182-8220
 Phone: 619-594-3938
 Fax: 619-594-4109

August 23, 2010

Student Researcher: Cheryl Pham
 Faculty Sponsor/Thesis Chair: Dr. Barbara Moss
 Department: Education

Title: *An Investigation of How Elementary Teachers Make Data-Driven Instructional Decisions in Literacy*
 vIRB Number: 524060
 Risk Level: Minimal
 Exemption: 45 CFR 46.101(b)(2)

Dear Cheryl Pham:

The project referenced was reviewed and verified as exempt in accordance with SDSU's Assurance and federal requirements pertaining to human subjects protections within the Code of Federal Regulations (45 CFR 46.101). This review applies to the conditions and procedures described in your protocol.

The determination of exemption is final and requests for continuing review (Progress Reports) are not required for this study. However, **if any changes to your study are planned**, you must submit a modification request and receive either IRB approval (per 45 CFR 46.110 or 46.111) or IRB verification that the modification is exempt (per 45 CFR 46.101). To submit a modification request, access the protocol via the WebPortal, on the protocol Main Page, you will need to click on "Modifications" under Protocol Maintenance and enter a report. Once you have filled in your responses on the report form, click "submit". Additionally, notify the IRB office if your status as an SDSU-affiliate changes while conducting this research study (you are no longer an SDSU faculty member, staff member or student).

PLEASE NOTE: Exempt verification is contingent upon your agreement to use the Recruitment-Informed Consent statement labeled "Pham_RecruitmentMaterial-Consent statement_IRB FINAL.doc" for consent purposes.

Please note the following for all exempt studies:

- a) If this research involves the use of existing or secondary data sources, information obtained must be recorded so that subjects cannot be identified, either directly or through identifiers linked to the subjects.
- b) If information will be obtained from individual medical records, please check with the organization authorized to provide access to these records to determine whether regulations relating to the Health Insurance Portability and Accountability Act (HIPAA) pertain to your research. Likewise, if academic records are accessed, Federal Education Rights and Privacy Act (FERPA) requirements must be respected. Notify the SDSU IRB office if protocol revisions are necessary to comply with HIPAA regulations.
- c) If recruitment will take place through an outside agency or organization, confirm with that

Graduate and Research Affairs
Division of Research Affairs
 San Diego State University
 5500 Campanile Drive
 San Diego CA 92182-8220
 Phone 619-594-5938
 Fax 619-594-4109

institution that you have permission to conduct the study prior to initiation of any study activities. If this research involves the use of existing or secondary data sources, confirm with the data owner that you have permission to access the data.

d) Approval is contingent upon the completion of the SDSU human subjects tutorial (found at: <http://www-rohan.sdsu.edu/~gra/login.php>) by all members of the research team. This certification must be renewed every 2 years.

For questions related to this correspondence, please contact the IRB office ((619) 594-6622 or e-mail irb@mail.sdsu.edu). To access IRB review application materials, SDSU's Assurance, the 45 CFR 46, the Belmont Report, and/or any other relevant policies and guidelines related to the involvement of human subjects in research, please visit the IRB web site at <http://gra.sdsu.edu/research.php>.

Graduate Students: This notification may be used as documentation to register in Thesis 799A. Attach a hard copy of this notice to your Appointment of Thesis/Project Committee form prior to submitting the completed form to Graduate and Research Affairs - Student Services Division.

Sincerely,

Jeanne Nichols
 Chair, Institutional Review Board

Amy McDaniel
 Regulatory Compliance Analyst

Choya Washington
 Regulatory Compliance Analyst