ANALYZING THE IMPACT OF A DATA ANALYSIS PROCESS TO IMPROVE INSTRUCTION USING A COLLABORATIVE MODEL

by

REBECCA B. GOOD

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TO IMPROVE INSTRUCTION USING A

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Adviser

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Dean of the College

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Dean of Graduate Studies and Research

ABSTRACT

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COLLABORATIVE MODEL

Rebecca B. Good, EdD
Texas A&M University-Commerce, 2006

Adviser: Sherion Jackson, EdD

The Data Collaborative Model (DCM) assembles assessment literacy, reflective practices, and professional development into a four-component process. The sub-components include assessing students, reflecting over data, professional dialogue, professional development for the teachers, interventions for students based on data results, and re-assessing to measure the impact of the changes made in both teacher practice and student interventions. The need to study the impact of the DCM initiative necessitated this study.

The purpose of this quantitative, causal-comparative study was to examine the relationship between using the Data Collaborative Model (DCM) and student achievement through TAKS passing rates in math and reading. The rationale was campuses that have attempted to create and implement a culture of data-driven decision making in a collaborative, reflective setting over a 3-year period of time would see an increase in teacher effectiveness (DuFour, 2004b). This process should have a natural output of increased student performance (Stiggins, 2004). Particularly, this study examined whether or not this was true in the six high implementation schools selected after comparing their TAKS reading and math passing rate means against six campuses that had low implementation of the DCM process and tools based on survey results.

The study revealed that there was not a statistical significance in TAKS passing rates in reading between high and low implementation campuses in the within and between tests. There was a statistical difference, however, in math, both in the within and the between tests in Usage Type. The study also showed that high implementation campuses had higher TAKS passing rates and mean gains than low implementation campuses. Finally, it revealed that teachers are more likely than administrators not only to understand the DCM, but to use the process and tools more often.

In conclusion, this study found that further research would be required to analyze why there was a statistical difference in math but not reading. It also recommended that a similar study should follow in 2 years to re-measure the effectiveness of the Data Collaborative Model.

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Chapter 1

INTRODUCTION

Children are the living messages we send to a time we will not see.
-- N. Postman (1982, p. xi)

All around the nation, school reform is in the air (Fullan, 2001). Whether it is through accountability issues or high school redesign, reform is now a constant inside and outside educational venues. Educational issues frequently make the front pages of daily newspapers and are discussed by those who understand school finance issues, property taxes, and resulting connections to the state legislature, especially in Texas.

In the "old days" teachers were lone rangers. They wrote their lesson plans alone and closed their door when they were teaching (Combs, Miser, & Whitaker, 1999; Martin-Kniep, 2004). Although they might share ideas when a new teacher asked for discipline help, usually that was the extent of teacher collaboration.

In the present educational system, the No Child Left Behind Act (NCLB) of 2001 (National Conference of State Legislatures, 2006), has come to dominate the direction of education. NCLB legislation called for stronger instructional practices aligned to assessment systems that could be counted on to close the very noticeable achievement gap between children of poverty and certain ethnic groups and Anglo students. The purpose of NCLB clearly stated that all children were to have an equal opportunity to acquire a high quality education that would be measured by academically challenging state assessments.

Educational journals such as *Phi Delta Kappan*, *Educational Leadership*, *Journal of Staff Development*, *School Administrator*, *Journal of Curriculum Studies*, and others have brought their readers promising practices that have worked in schools around the country. Practices such as constructivist versus direct instruction, collaborative lesson studies, professional learning communities, job-embedded professional development, team meetings, smaller learning communities, data-driven decision making, and distributed leadership have all been studied, debated, written about, and initiated on campuses all over the country (Council of the Great City Schools, 2004; DuFour & Eaker, 1998; Hunt, 2005; Klonsky, 1998). Some of the better known researchers espousing school reform practices include Larry Lezotte (1991) with the effective school correlates, Michael Fullan (1998) who talked about cultures of change, Rick Stiggins (2004) who wrote extensively on assessment literacy, Rick DuFour (2004b) with his professional learning communities, Robert Marzano (2003) with classrooms that work, and Mike Schmoker (2004b) and Peter Senge (1990) who have written at length on learning organizations and what it takes to change them. Schmoker (2004b) has begun to write forcefully about what is working in successful schools:

> Thousands of schools and even entire districts can attest to the power of these structures for promoting first incremental and then cumulatively dramatic and enduring improvements in teaching and learning. (…) schools and districts have made substantive, enduring gains in achievement, largely on the strength of well-structured, goal-oriented learning teams and communities. (p. 431)

The necessity to increase the quality of American public education has been well documented since the 1980s when *A Nation at Risk* was published (National Commission on Excellence in Education, 1983). Achievement scores for high school students were the lowest in two decades, and SATs were down as well (National Education Goals Panel, 2000). The National Commission on Excellence in Education recommended looking at:

> …the quality of teaching and learning in all educational areas, which include private and public school and institutions of higher learning; comparing American education against other advanced nations; looking at the relationship between high school graduation and college entrance along with which educational programs lead to success in college; looking at causal factors that have impacted education in the last twenty-five years; [and] defining the problems in education which must be overcome if the nation is to have excellence in education. (¶ 2)

The only surprise 23 years later is how little has been achieved in the area of educational reform. This statement is supported by the fact that the NCLB goals seem to be a repeat of the goals set by the National Goals Panel in the 1980s (Center for Educational Decision Support Systems, 2004). The National Goals Panel goals, which were to address areas such as the quality of teaching and learning in all educational areas, high school graduation rates, and college entrance rates, remain current issues.

Statement of Problem

The age of accountability (Guskey, 1998) has focused attention on not only what is taught but also how it is taught (Marzano, 2003). Not only is there a need for reliable assessments aligned to rigorous curriculum but also how to use the information given by the assessments (Stiggins, 2004). A process must be in place to help campuses understand how to read data and to turn the information into an action plan:

> When this process is absent, confusion reigns. Staff from (…) schools indicated that they did not see the connection among teacher-administered in-class

> assessments, their norm-referenced district test, and the large-scale state assessment. Nor did they know what to do with this information. (Learning Point Associates, 2000, p. 1)

Although some states are expanding their databases and using more reliable accountability systems, most have not begun to promote the need for local capacity in understanding the data received (Center for Educational Decision Support Systems, 2004). Administrators and teachers have been handed pages of data reports for several years without much, if any, instruction in what to do with the information. As the reports get more sophisticated, the data can show in an even deeper manner what skills students are not performing well. Information on utilizing data to impact classroom instruction in order to increase student achievement has been lacking.

Purpose of the Study

The purpose of this study was to examine the relationship between using the Data Collaborative Model (DCM), a process of instructional improvement using data analysis, and student achievement through TAKS passing rates in math and reading. The focus was on whether the DCM process and tools changed teacher practice enough to impact student achievement. The rationale was that campuses which have attempted to create and implement a culture of data-driven decision making in a collaborative, reflective setting over a 3-year period of time, would see an increase in teacher effectiveness. This process should have a natural output of increased student performance. The study examined whether or not this was true in the six high implementation schools selected, based on survey results.

Research Questions and Hypothesis

The research questions were written in collaboration with district officials who had an interest in the results of the study. Of particular interest to this study were the questions regarding whether the data analysis process in place for 3 years actually had an impact on student achievement on those campuses having a high level of implementation of the Data Collaborative Model system. The following research hypothesis and questions were used to guide this study:

Hypothesis: There is a statistically significant difference in TAKS passing rates between high implementation and low implementation campuses after using the Data Collaborative Model for a 3-year period of time.

1. What was the relationship for teachers between the self-reported (based on the DCM survey results) understanding versus actual use of common and continuous assessment?
2. What impact does regularly scheduled teacher reflection on data have on student achievement?
3. What is the relationship between job-embedded professional development and student achievement?
4. What impact does the use of the DCM have on student achievement over a period of 3 years?
5. Does exposure to a model that uses data analysis to impact instruction result in a change in the usage of the district's online data web?
6. Is there a difference in DCM usage perception between campus administrators and teachers?

7. What impact does the principal have on the implementation of the DCM model?

Description of the Study

The Data Collaborative Model (DCM) assembled assessment literacy, reflective practices, and professional development into a four-component process. The sub-components include assessing students, reflecting over data, professional dialogue, professional development for the teachers, interventions for students based on data results, and re-assessing to measure the impact of the changes made in both teacher practice and student interventions. The need to study the impact of the DCM initiative necessitated this study. The study helped the district with the funding decision related to implement the DCM initiative.

This research study was a causal-comparative study that looked at student achievement over a 3-year period of time between two groups of campuses. The first group, called the high implementation group, stated through their survey responses that their campus understood and used the DCM process and tools at a high level based on means. The second group, called the low implementation group, consisted of campuses that had a lower level of understanding and usage of the DCM process and tools.

A field test was conducted using the DCM survey created to measure the impact of this initiative. The pilot was sent out to a sample of 20 people purposely selected to mirror the categories listed on the survey. The categories were principals, deans, content teachers, instructional specialists, special education and ESL teachers, fine arts teachers, and Technical Assistance Providers (TAP). When the pilot surveys were returned, the feedback and data were analyzed to see if changes to the instrument were warranted. A more in-depth discussion of the field test can be found in Chapter 3.

The participants in this study were sent a revised survey (see Appendix A) based on the pilot study analysis. The survey requested that administrators and teachers answer questions about the degree of implementation of the process and the various DCM tools available. Returned surveys identified the campus by numbers and campus administrators and teachers by position, not by name. The survey questions helped identify six campuses that had a high degree of DCM implementation over the last 3 years and six campuses that had a low level of implementation. Once those 12 campuses were selected, a database was constructed. The database included reading and math passing rates from the Texas Essential Knowledge and Skills (TAKS) test over the 4-year period that the TAKS had been given. Also added to the database were additional DCM trainings that each campus had received. The control treatment was that all campus principals had received a standard training on the DCM process and tools over the last 3 years. Additional training opportunities were available to those sub-areas and/or campuses that requested them.

The district studied was the second largest in the state of Texas with an urban population of 160,000 students. The ethnic breakdown was 61% Hispanic, 31% African American, 6% White, and 1% Other (Texas Education Agency, 2004). The district encompasses an area of 312.6 square miles and includes all or portions of 11 municipalities (Wikipedia, 2006, ¶ 2). The district's students came from homes where almost 70 different languages were spoken and over one-third of the student population is classified as second language learners (Texas Education Agency, 2004). More than 79% of the district's students qualify for free/reduced lunch assistance.

Urban issues including poor student achievement, inexperienced teaching staff, political strife, high student mobility, a lack of instructional rigor and coherence, and bureaucratic business practices can be seen in this district just like in other urban districts (Council of the Great City Schools, 2002). Over the past 3 years, many initiatives were implemented to help create a stronger change climate. Among those initiatives were process management training for central office and other interested campus personnel; cross-functional training; Balanced Scorecard (Kaydos, 2003); Lean Six Sigma (Six Sigma, 2006); realignment of the written, taught, and tested curriculum (English, 2000); and finally, instructional improvement by means of data analysis through the Data Collaborative Model (Garcia, 2005).

Assumptions of the Study

To further explain this study, several assumptions were made. The first assumption was that the information reported by the participants on the survey was honest and accurate. Second, the TAKS data information received from the Texas Education Agency's Academic Excellence Indicator System (AEIS) was accurate. The third assumption was that all the data turned into the Texas Education Agency was accurate. In addition to this was the assumption that other data on the Texas Education Agency website was also accurate. The final assumption is that most administrators and teachers want positive educational change, even if they are unsure how to go about implementing the change (Fullan, 2001).

Limitations

This study was limited in several ways. The first limitation was that principals who received the e-mailed request to pass the survey link on to their teachers did not always do so. The campus staffs that received the survey did not always take the time to answer it, which was the second limitation. A lack of serious approach by the campuses in the use of the three early release days as professional learning communities opportunities was a third limitation. The fourth limitation was based on teacher turnover, principal changes, and sub-area feeder pattern changes that occurred during the 3-year study. A final limitation was that the researcher was held to the timelines of the leadership of the district as to when approval was granted to send out the survey to the principals and that the survey would be classified as optional by the district leadership.

Significance of the Study

The Data Collaborative Model has been in place for 3 years. This study was designed to examine the effectiveness of the model that used the teaching practices of meeting regularly with student data and sharing successful strategies in order to change instruction. As campuses put time and energy into implementing best practices, it was important to measure the effectiveness of those practices (Killion, 2002).

Campuses must keep a careful and timely eye on what is an effective instructional practice and what is not. Accountability measures such as Adequate Yearly Progress (AYP) and the Academic Excellence Indicator System (AEIS) publish the *grades* of each campus and district yearly using the results of state assessments as one component of the school evaluation system. Campus and district leaders must choose the most effective practices based on research to help impact student results and close achievement gaps (Elmore, 2005; Fullan, 1998).

Definitions of Terms

The following is a list of supported definitions. The terms should help clarify meaning throughout the remainder of the study.

Academic Excellence Indicator System (AEIS)–"pulls together a wide range of information on the performance of students in each school and district in Texas" every year based on indicators such as the Texas Assessment of Knowledge and Skills (TAKS) test, drop out and attendance rates, and more (Texas Education Agency, 2002, ¶ 1).

Adequate Yearly Progress (AYP)–the process NCLB uses to represent "the annual academic performance targets in reading and math that the State, school districts, and schools must reach to be considered on track for 100% proficiency by school year 2013-14" (Colorado Department of Education, 2004, The ABCs of AYP page, ¶ 5).

Assessment literacy–"the collective capacity of teachers and leaders in schools to examine data, make critical sense of it, develop action plans based on the data, take action and monitor progress along the way" (Fullan, 2001, p. 127).

Benchmark assessment–designed to assess student mastery as a result of Texas Assessment of Knowledge and Skills (TAKS) instruction and serve as an indicator for student success on TAKS (Garcia, 2005).

Collaborative/reflective–an environment where teachers meet together in a shared setting to reflect over data such as assessments, student work, and lesson plans (Cowan, 2006; Ferraro, 2000).

Distributed leadership–leadership as spread across multiple people and situations (Timperley, 2005).

Job-embedded professional development–instructional learning that teachers acquire as they go through their daily work activities. It can include discussion with others, peer coaching, mentoring, study groups and action research in both a both formal and informal manner (U.S. Department of Education Professional Development Team, 1994).

Professional Learning Communities (PLC)–a meeting where teachers "focus on learning rather than teaching, work collaboratively, and hold [each other] accountable for results" (DuFour, 2004b, p. 6).

Researcher and Researcher Bias

The researcher has been the Executive Director of the Data Collaborative Model for the past 2 years. The researcher created many of the tools and processes used in the trainings. The researcher understands that she may have a bias toward wanting the Data Collaborative Model to be a successful change process for campuses. Although principals' and teachers' perceptions will form the basis of all conclusions, the researcher also has assumptions that may influence the interpretation of results.

Summary and Chapter Overview

The urban student tends to be a minority child living in poverty (Council of the Great City Schools, 2002). Achievement gaps are the norm for this student. He or she has a higher chance of being impacted by second language, special education, and/or single parent issues. Too many students are being left behind while ways to teach them are sought (English, 2006; Marzano, Pickering, & Pollock, 2001). As Fenwick English said in 2006 at a conference for Texas administrators: "without alignment [between assessments and curricula], student and community demographics will continue to be the largest predictors of student test results--noted since 1951 by Edward L. Thorndike in the research literature" (English, 2006). The urban child needs teachers and administrators who understand how to balance demographics with a high level, standards-based curriculum that is relevant and rigorous. As mentioned by Fenwick English, this is the only way campuses will be able to avoid having demographics predict student achievement.

Over the last two decades, great strides have been made to add more rigor to the national and state standards (National Governors Association, 2006). Alignment between what is taught and what is tested has been strengthened, but there is a long way to go before there is a closing of the achievement gap (National Governors Association, 2006). Research has identified best practices that have proven effective with urban students (Marzano, 2003; Resnick & Glennan, 2002; Schlechty, 2002; Schmoker, 2004a, 2004b). The research says a campus must have consistent implementation of these best practices by teachers of urban students using a collaborative, reflective model such as the DCM (DuFour & Eaker, 1998; Ferraro, 2000; Martin-Kniep, 2004).

Chapter 2 contains a review of the literature related to the historical background of educational reform and those policies that led to educational change in the last 30 years. The components of the Data Collaborative Model, which include assessment literacy, professional learning communities, job-embedded professional development, distributed leadership, and organizational change are summarized with a focus on the leading researchers.

Chapter 2

REVIEW OF THE RELATED LITERATURE

The best practices that made up the Data Collaborative Model included assessment literacy, professional learning communities, and job-embedded professional development. Two necessary practices that were also included in the model were distributed leadership and organizational change. The historical perspective will set the tone for the need for an initiative with practices that were in the DCM.

Historical Perspective

School reform has been a practice in the United States since the mid-17th century. The first educational movement in the New World began with the Puritans in 1630, who came not to bring religious freedom for all, but to enforce the religion in which they believed (Henson, 2003). According to Henson, “The main motivation for the Puritans’ long, expensive, and dangerous journey to the New World was their desire to build a new community to worship God” (p. 85). Because the Puritans thought the Devil would “take advantage of their children’s ignorance and mislead them” (p. 85), they quickly moved to establish schools. The first were the Dame Schools, where only reading was taught at home, usually in the kitchen. Later the Old Deluder Satan Act, passed in 1647, required communities with more than 50 families to teach reading and writing, which continued to take place in the setting of the home. Once the community reached 100 or more families, a more formal Latin school was added to the community. In a Latin school, the religious and language-based curriculum had to be taught by a hired teacher, not the families themselves (Henson, 2003).

By the mid-18th century, the Franklin Academy, with its more practical curriculum, which included the teaching of mathematics, bookkeeping, and astronomy, replaced the Latin school curriculum (Henson, 2003). A century later, during the "common school movement" (Webb, Metha, & Jordan, 2000, p. 175), half of the nation's children were in school (Henson, 2003). According to Webb et al. (2000), "State control as well as direct taxation for the support of the common schools–publicly supported schools attended in common by all children–became accepted practices" (p. 176). Educational change had already begun and would continue until present time:

> The history of American education is replete with examples of supposed panaceas. Taking the shape of "reforms," these well-meaning efforts–often worthy in themselves–have dotted the educational landscape since the time of Horace Mann in the 1830s and 1840s. For example, the common school itself would remove all crime and poverty from American society. Mann described it as the "greatest invention ever made by man." (Hunt, 2005, pp. 84-85)

In the late quarter of the 19th century, secondary public school became more firmly established (Webb et al., 2000). The secondary public school movement had grown slowly before then, with most of the secondary schools being located in the North. It was not until industrial growth "intensified the demand for skilled workers" (p. 183) that secondary high school growth increased. High schools became necessary not only to meet the skill needs of the industrial age, but were also important to help the children of the large number of immigrants learn about "American ideals and values" (p. 183).

In 1892, the National Education Association (NEA) saw a need to standardize the curriculum (Webb et al., 2000). It established a Committee of Ten, which made recommendations to schools that they include vocational training and practical courses in their curricula. They asked for, "an early introduction to the basic subjects and uniform instruction and instruction for both college-bound and terminal students, with few electives" (p. 184). It was this committee that also created the concept that courses should meet four to five times a week for a year. A unit of credit would then be earned after completion of the year.

The American comprehensive high school, as we know it today, was essentially in place by the 1920s. It had been extended to 4 years and typically had students aged 14–18 who attended (Resnick & Hall, 1998; Webb et al., 2000). Junior high schools began appearing in urban areas, "as an outgrowth of the recommendation by the Committee of Ten that academic work begin earlier and that elementary schooling be reduced from eight to six years" (Webb et al., 2000, p. 185; see also Resnick & Hall, 1998).

Many educational changes occurred in the 20th century due to social, economic, and political factors. Population growth was up to 106 million (up from 50 million in 1880) (Population Reference Bureau, 2006), due in part to upwards of half a million immigrants arriving each year from 1905–1914 (Webb et al., 2000). The country was also becoming increasingly more urban. The economic growth spurred by the industrialization of the country created rapid growth in railroad and other transportation industries as well as communication industries. With this came an increase in the number of students attending school which in turn led to a need for more schools, more teachers, and certainly more resources. By the end of World War II, returning servicemen filled the colleges, and within a few years the postwar baby boom hit the public schools (Webb et al., 2000).

By 1957, the Sputnik scare motivated the federal government to pass the National Defense Act (NDEA). The NDEA "was instituted primarily to stimulate the advancement of education in science, mathematics, and modern foreign languages" (*Columbia Encyclopedia*, 2001, National Defense Education Act, ¶ 1). More curriculum reforms followed, each recommending that rigor be increased in the academic core areas (Henson, 2003).

It was not until the third quarter of the 20th century that there would be any substantial improvement in the education of African Americans, Native Americans, Mexican Americans, and Asian Americans (Webb et al., 2000). Separate schools and poor resources were the norm for these students until the civil unrest of the 1950s and 1960s (Resnick & Hall, 1998).

In 1983, the National Commission on Excellence in Education published its report, *A Nation at Risk: The Imperative for Educational Reform* (National Commission on Excellence in Education, 1983). It was one of many such reports that year, but its title and provoking language set it apart almost immediately. The book's message warned that the country was sliding into educational mediocrity that endangered the nation's future (Gordon, 2003). Several risk indicators delineated the upcoming threat in that it compared American students with other industrialized nations and did not fare well. It also predicted that the College Board's Scholastic Aptitude Tests (SAT) and other College Board achievement tests would reveal consistent declines in recent years in such subjects as physics and English. (National Commission on Excellence in Education, 1983) *A Nation at Risk* became the symbolic opening barrage in a 20 year struggle to improve schools, as the report helped put education reform at the top of the national agenda.

In 1989, the National Education Goals Panel (NEGP) was created during the National Education Summit in Charlottesville, North Carolina. This was an unprecedented meeting between President George H. W. Bush and the nation's governors, including Bill Clinton, governor of Arkansas. It was the first time people in these positions had met together to focus exclusively on how to improve the educational performance of the nation (The National Education Goals Panel, 2000). The Summit led to the adoption of six (later eight) National Education Goals that were to be met by 2000. The goals stated that

> All children will start school ready to learn, high school graduation will increase to 90%, students will become competent in challenging subject matter, teachers will have the knowledge and skills they need, and U.S. children will be first in the world in mathematics and science. (National Education Goals Panel, 2000, Goals Work! ¶ 5)

Whereas the result of previous educational initiatives looked for results in monitoring compliance with rules and regulations, the National Education Goals Panel focused on results (National Education Goals Panel, 2000). This changed the way educational systems were judged. By 2001, 41 states began issuing annual report cards on campus performance. Almost half the states began identifying high and low performing schools by this time as well. Before the National Education Goals Panel was established, educational reform movements did not last through changes in leadership either at the national, state, or local levels (The National Education Goals Panel, 2000). In 1991, at the recommendation of The National Goals Panel, Congress established the National Council on Educational Standards and Testing. This bipartisan council looked at establishing national standards to describe what students needed to know and be able to do. The council recommended that national standards be established that had high expectations, were dynamic and not static, and not be federally mandated. Grants were then provided through federal agencies and private sources to encourage the development of national standards. By 2000, most states had established statewide standards that were more rigorous in the four core areas and had begun to align assessment systems to them (National Education Goals Panel, 2000).

In 1989, the National Education Goals Panel had concluded that there were not data available to compare states easily, there were no commonly acceptable performance levels, no comparable high school completion information, and no comparable state data on school safety issues such as violence or drugs. Once these gaps were identified, collection efforts increased at all levels in all areas (National Education Goals Panel, 2000).

When President Clinton came to office in 1991, he adopted most of the recommendations that came out of the first Education Summit. He then created his own proposal, called *Goals 2000*, which produced the National Education Standards and Improvement Council (National Conference of State Legislatures, 2006). This Council could approve or reject states' standards. During the midterm elections of 1994, many people in Congress voiced strong resistance to the increased federal role in education and the council consequently died. But the increased accountability and federal focus on standards continued despite the opposition (National Conference of State Legislatures, 2006).

The government continued its engagement in accountability issues when President Clinton signed the Improving America's Schools Act (IASA) of 1994 (National Conference of State Legislatures, 2006). IASA was a reauthorization and revision of the original Elementary and Secondary Education Act (ESEA). This legislation asked for continued development of state standards, development of categorized performance standards (partially proficient, proficient, and advanced for each content area), implementation of assessments aligned with instruction in grades 3-12, measurement of Title 1 students, and

> …the use of performance standards to establish performance standards to establish a benchmark for improvement referred to as “adequate yearly progress.” All Local Education Authorities (LEA) and schools must show continuous progress toward meeting the AYP standard or face possible consequences, such as having to offer supplemental services and school choice or replacing the existing staff. (National Conference of State Legislatures, 2006, History page, ¶ 15)

Although states were allowed to create their own educational system, the states had to follow the requirements of IASA to be able to continue receiving federal funds (National Conference of State Legislatures, 2006).

Enter into this climate of educational focus on standards and assessment the reauthorization of Elementary and Secondary Education Act (ESEA), now called the No Child Left Behind Act (NCLB of 2001). This Act, signed by President Bush in January of 2002, increased federal funding to states by more than 24%. Attached to the increase in federal funding came a rise in federal mandates and sanctions. The act required those states that accepted the federal funds to increase student testing and to improve the quality of the assessments as well. It also mandated that schools have highly qualified teachers in each classroom as defined by NCLB. This act also held schools accountable for the performance of students with strong penalties for not meeting Adequate Yearly Performance (AYP) requirements (National Conference of State Legislatures, 2006). The age of accountability, as Thomas Guskey (1998) and others (Goldhaber & Hannaway, 2004) have called it, was and continues to be, upon the nation.

This historical review sets the tone for the current educational environment of reform. Education related books and journals are filled with studies of instructional and other school-related practices that increase teacher practice and student effectiveness (DuFour, 2004b; Marzano, 2003; Marzano, Pickering, & Pollock, 2001; Schmoker, 2004a). The Data Collaborative Model took several of the best practices that researchers had studied and written about and folded them into an initiative to help campuses impact instruction.

Accountability Practices

When talking about impacting instruction through a data analysis process, one first must break it up into the practices or components that make up the process. The components of the Data Collaborative Model are a combination of (a) assessment literacy; (b) professional learning communities, which includes collaborative and reflective practices; (c) job-embedded professional development; (d) distributed leadership; and (e) organizational change. All of these components, when implemented on a campus, pave the way for a collaborative culture that leads to assessment literacy (Fullan, 2001; Timperley, 2005).

Rick Stiggins (2004), along with other researchers (Bernhardt, 1999; DuFour & Eaker, 1998; Holcomb, 2004; Schmoker, 2004b; Stiggins, 2004), all suggested integrating the curriculum with assessment and creating an assessment culture. In addition to learning how to align assessment to their instruction, campus teachers have also been asked to examine how instruction is provided (DuFour, 2004b; Henson, 2003; Jacob, 2004; Marzano, 2003; Marzano, Pickering, & Pollock, 2001; Schlechty, 2002; Schmoker, 2004a). Educational researchers have studied methods that increase student performance and teacher effectiveness (Allington & Cunningham, 1996; DuFour 2004a, 2004b; Marzano et al., 2001; Schlechty). Among the most written about "best practices" are professional learning communities (DuFour & Eaker; Hord, 1997; Schmoker, 2004a, 2004b), collaboration over student work and teacher-made tests (DuFour & Eaker), checking for rigor and relevancy in the every day curriculum (Erikson, 2002; Jacob, 1997, 2004; Klonsky, 1998), distributed leadership (Timperley, 2005), job-embedded professional development (DuFour, 2004a; U.S. Department of Education Professional Development Team, 1994), and learning organizations (Schmoker, 2004a, 2004b; Senge, 1990; Senge, Kleiner, Roberts, Ross, & Smith, 1994).

Assessment literacy. In this age of accountability, it has been found through research studies that not all administrators and teachers understand the relationship between what is written, taught, and tested (Earl & Fullan, 2003; English, 2000). As Lorna Earl and Michael Fullan wrote in 2003,

> There was a time in education when decisions were based on the best judgment of the people in authority. It was assumed that school and district leaders, as professionals in the field, had both the responsibility and the right to make decisions about students, schools and even about education more broadly. They did so using a combination of intimate and privileged knowledge of the context, political savvy, experience and logical analysis. Data played almost no part in decisions. (p. 383)

The need to understand the role of assessment is becoming more important as school personnel come to understand that it is a vital piece of an instructional process that includes data-driven decision making (Earl & Fullan, 2003). Assessment literacy for administrators and teachers is still a relatively new field. In 1999, Rick Stiggins mentioned during an interview with Dennis Sparks from the *Journal of Staff Development*, that only three states required competence in assessment for principal certification (Sparks, 1999). Few teachers and administrators had an opportunity to develop assessment literacy skills. A teacher spends one third to one half of his or her professional time in assessment-related activities, so it is necessary to acquire skills to know how to use assessments as instructional tools (Sparks, 1999).

Schmoker (2004b) wrote that only in learning teams can assessment literacy, which is so necessary to the ongoing improvement of instruction, be obtained. Workshops will not allow “the application of and experimentation with new assessment ideas in real classrooms, and sharing that experience with other colleagues in a team effort” (Schmoker, 2004b, p. 430).

Professional learning communities. Much is being written on the need for district professionals to understand better the relationship between assessment and curriculum (Learning Point Associates, 2000; National Education Association (NEA), 2003; Schmoker, 2004a; Stiggins, 2004). Testing what was just taught does not always happen in a clearly defined way. Much has to do with the teachers' lack of training in how to create reliable assessments (Sparks, 1999; Stiggins, 2004).

The literature has begun to connect the data with action plans that lead to a change in instruction and professional development (Center for Educational Decision Support Systems, 2004; Learning Point Associates, 2000; NEA 2003; Stiggins, 2004). Professional learning communities have been one of the mechanisms used to achieve this through encouraging teachers to discuss data and to share strategies in an effective manner (DuFour, 2004b). Others besides DuFour, the originator of the practice, have begun to favor the use of professional learning communities (PLC):

> Learning communities are the means by which we can break [teacher] (…) isolation and foster a collaborative environment and reflective culture. In fact, creating a collaborative environment has been described as "the single most important factor" for successful school improvement initiatives and the "first order of business" for those seeking to enhance the effectiveness of their school. (Eastwood & Lewis, 1992, p. 215)

Shirley Hord (1997), a long time advocate for educational change and professional learning communities, wrote that both teachers and students benefit from teachers meeting as learning communities. The benefits included reduction in the isolation of teachers, increased commitment to the mission, shared responsibility for the development of student and their success, increased meaning and understanding of the content that teachers teach, and a higher likelihood that teachers were well informed, professionally renewed, and inspired to inspire students. Teachers also felt more job satisfaction, had higher morale, and less absenteeism. The benefits for students were as necessary as the ones for teachers:

> The benefits for students included decreased dropout rate and fewer classes "skipped," lower rates of absenteeism, increased learning that is distributed more equitably in the smaller high schools, greater academic gains in math, science, history, and reading than in traditional schools and smaller achievement gaps between students from different backgrounds. (Hord, 1997, p. 28)

In his more recent articles, Schmoker (2004a, 2004b) reiterated the need for and lack of use of best practices such as PLCs. Schmoker was clear in what the research is saying about teacher practice:

> Mere collegiality won't cut it. Even discussions about curricular issues or popular strategies can feel good but go nowhere. The right image to embrace is of a group of teachers who meet regularly to share, refine and assess the impact of lessons and strategies continuously to help increasing numbers of students learn at higher levels. (Schmoker, 2004a, ¶ 12)

Schmoker also listed researcher after researcher who agreed that the collaborative practice emphasized by PLCs must happen to have an increase in student achievement:

> The concurrence on [continuous, structured teacher collaboration] is both stunning and under-appreciated. Advocates for focused, structured teacher collaboration include Roland Barth, Emily Calhoun, Linda Darling-Hammond,

> Richard Elmore, Michael Fullan, Bruce Joyce, Judith Warren Little, Dan Lortie, Milbrey McLaughlin, Fred Newmann, Susan Rosenholtz, Rick Stiggins, James Stigler, Joan Talbert, Gary Wehlage, Grant Wiggins, Ronald Wolk and numerous others. (Schmoker, 2004a, p. 1)

The research was clear, the studies on successful practices more numerous, and yet the results were the same. Elmore found in 2005 that campuses were reluctant to embrace practices that work due to internal and external factors. An internal factor such as a lack of accountability would make schools less successful for the following reasons:

> They are less likely to exercise control over student curriculum and performance. They also are more likely to grasp for superficial solutions to external pressures-for example, teaching test items rather than developing and teaching higher-level content. And, they are more likely to set expectations in the prevailing culture of atomization and the existing abilities of individuals–for example, pushing harder on individual teachers instead of designing collective responses that make the work of the organization more powerful. (Elmore, 2005, p. 2)

Fullan (2005) insisted that PLCs, as done in the present educational system, would not gain beyond 20% in popularity in a district and would have only pockets of strong usage. The practice would only last as long as those that have sustained its use were on that campus unless a greater perspective was understood and added. Fullan wrote of a need for tri-level implementation, where the PLCs' concept was brought to the attention of not only the school community but also the district and state level as well. Without all those entities supporting the use of PLCs, a systemic change would not occur.

Job-embedded professional development. A veteran teacher's definition of professional development would more than likely be, a set number of hours in staff development done in order to fulfill a contractual obligation for employment, usually done through district or local service center offerings. The literature now challenged that thinking (DuFour, 2004a; Resnick & Glennan, 2002; U.S. Department of Education Professional Development Team, 1994). As early as 1994, the U.S. Department of Education promoted job-embedded professional development as "continuous inquiry and improvement embedded in the daily life of schools" (U.S. Department of Education Professional Development Team, 1994, The Mission & Principles of Professional Development page, ¶ 5) and "planned collaboratively by those who will participate in and facilitate that development" (¶ 5). As Rick DuFour wrote, "The traditional notion that regarded staff development as an occasional event that occurred off the school site has gradually given way to the idea that the best staff development happens in the workplace rather than in a workshop" (2004a, p. 63).

One of the key strengths of the professional teaching and learning cycle was its design as a job-embedded professional learning process that was ongoing and results driven. According to multiple correlation studies on teacher quality (Darling-Hammond, 2000; Darling-Hammond et al., 2003), higher levels of student achievement were associated with educators who participated in sustained professional development grounded in content-specific pedagogy. Continuous professional learning that increased teacher outcomes, in turn, impacted student outcomes. Reviews of studies indicated that when teachers improved their instructional practices, student achievement also improved

(Darling-Hammond, 2000; Marzano et al., 2001; Southwest Educational Development Laboratory, 1997).

Organizational change. The literature focused on the need to create a school climate that was ready to accept change. Michael Fullan (1998, 2000, 2001, 2005) has written much in this area as well as Shirley Hord (1997). Peter Senge (1990), in his *The Fifth Discipline*, wrote that one must master the three components of organizational change: design, structure, and implementation. The desired change must get the whole organization "engaged and committed, both in favor of a shared vision and in a rigorous search for the truth. (…) Any coercive process, no matter how well intended, simply cannot result in commitment" (Senge, 1990, p. 438).

Distributed leadership. The literature on collaboration, professional learning communities, and reflective practices all mention that a natural outcome of these actions is teacher empowerment. As mentioned by Garcia in 2005, "Distributed leadership has its basis in cognitive development theory. Russian scholar Lev Vygotsky's theory of cognitive development pointed out the link between social interaction and the development of individual intelligence" (pp. 26-27). In essence, individual intelligence grows due to biological factors when people engage in a physical and social (cultural) environment (Timperley, 2005).

Today's principals are being asked to share their leadership with teachers for a more effective collaborative school culture (DuFour & Eaker, 1998; Hord, 1997). Sergiovanni (1996) explained that the foundation of authority for leadership was rooted in shared ideas, not in the power of position.

Summary and Chapter Overview

Chapter 2 contains a review of the literature related to the historical background of educational reform and those policies that led to educational change in the last 30 years. It also includes a description of the components of the Data Collaborative Model (DCM). The components of the DCM, which includes assessment literacy, professional learning communities, job-embedded professional development, distributed leadership, and organizational change are summarized with a focus on the leading researchers.

Chapter 3 contains a description of the methodology used to study the effects of the DCM components on 12 campuses according to their level of usage over a 3-year period of time. Sample selection procedures, instrument development, data gathering, and data analysis procedures are discussed. The objective of this quantitative study was to study the impact of the DCM, an instructional improvement process through data analysis model, on student achievement.

Chapter 3

METHOD

This chapter provides a description of the quantitative design used in the current study. The description of the subjects and the participating campuses appear first. The next two sections explain the data collection and procedures used. Then the construction and use of the databases and how data were analyzed follow.

The aim of educational research is to develop new learning about educational phenomena (Borg & Gall, 1989). Even further, the purpose is to build confidence that certain claims about the educational phenomena being studied were true or false. In the case of quantitative research, the goal is to gather data that prove or disprove the knowledge claim (Borg & Gall, 1989).

Quantitative research in education can be categorized as one of two types: descriptive studies and studies intended to discover causal relationships (Borg & Gall, 1989). Descriptive studies deal with finding out "what is," and the causal-comparative method "is aimed at the discovery of possible causes for the phenomena being studied by comparing subjects in whom a characteristic is present with similar subjects in whom it is absent or present to a lesser degree" (p. 331).

This research study is a causal-comparative study, looking at student achievement over a 3-year period of time between two groups of campuses. The first group of campuses, called the high implementation group, had stated through their survey responses that their campus understood and used the DCM process and tools at a high level based on mean survey responses. The second group of campuses, called the low implementation group, was made up of campuses that had a lower level of understanding and usage of the DCM process and tools, also based on survey results.

The DCM has been a district initiative for 3 years. The district itself was interested in measuring the impact of the DCM on student achievement. The researcher and district officials from the Evaluation and Accountability department collaborated on survey questions (see Appendix A) that could meet the needs of both the district and the researcher. Although most of the questions were of vital interest to the researcher, there were a few questions whose answers had little or no impact on this study. For example, survey item 22 asked if the participant knows whom to contact with a question about the DCM. The question was necessary for the district to know, but of minimal impact on this study.

Subjects

Over 1,000 campus administrators and teachers from a large southern urban public school participated in the survey. There were 217 campuses in the district, including 37 high schools, 24 middle schools, and 156 elementary schools. The schools were divided into six sub-areas, with a sub-area superintendent responsible for each sub-area. An e-mail from the deputy superintendent went out to the six sub-area superintendents asking if they would volunteer their campuses to participate in a survey of the Data Collaborative Model process and tools (see Appendix B). Sub-area superintendents e-mailed back their response to the deputy superintendent who then forwarded the e-mails to the researcher. Out of six sub-areas, five agreed to participate. That limited the campuses who could take the survey from 217 to 162 campuses.

Participating Campuses

Of the 162 schools that had the option to take part in the survey, 121 campuses returned surveys, resulting in a participation rate of approximately 75%. There were 12 elementary campuses that were selected for inclusion in the study. The 12 were selected first because there were more elementary schools that responded to the survey and also their staff participation rates were higher as well. The second manner of narrowing the field to 12 campuses was by high and low DCM process and tools usage rate based on mean results for survey items 3, 6, and 7. This allowed the researcher to use a sample of campuses (i.e., 10% of campuses that participated in the survey) to represent the entire district. Through analysis of DCM survey results, six campuses were determined to have high levels of understanding and usage of the DCM process and tools and were compared to six campuses that were judged to have a low level of DCM understanding and usage. A more thorough explanation is provided in the *Procedures* section of this chapter.

Data Collection

The survey instrument consisted of 22 questions with an estimated 7 to 10 minutes completion time (see Appendix A). The survey instrument was created in collaboration with the district's Evaluation and Accountability researchers. Permission was granted by district officials for use of their materials. The collaboration between the district and the researcher ensued because both sought information from this study. The survey was made available through an e-mailed invitation containing a web address to the survey, rather than a hard copy sent via the U.S. mail, since web surveys have been found to have as successful a response rate as ones sent through the mail (Kiernan, Kiernan, Oyler, & Gilles, 2005).

Also, the survey was made available through a link on the district data website (see Appendix C). Notice of the survey web address was sent to campus administrators through district e-mail three times to encourage participation (see Appendix D). Each time, a request was made of the principals to forward the DCM link to campus teachers.

The survey was written to identify 12 campuses that had high and low levels of usage of the Data Collaborative Model (DCM). Specifically, this survey examined how well teachers and campus administrators understood and used the DCM process and tools. The survey also was used to determine the difference between administrator and teacher usage perception.

Prior to administering the survey, a panel of professional colleagues examined the survey instrument for content validity. Minor changes in wording were incorporated when necessary. A copy of the informed consent letter and the survey can be found in Appendix E and A respectively.

TAKS passing rates for 2003-2006 were collected from a district database for the 12 campuses chosen to be studied. The TAKS reading and math passing campus rates represent a combination of all grades and students tested in each subject area.

Data on web usage by the campuses for 2004 through 2006 were also collected from the Office of Institutional Research (OIR). Those data were used to measure growth, if any, by campuses of data web usage. Web usage is measured by the number of pages visited.

Enrollment data and other district information were gathered through various outside sources so that district confidentiality could be maintained. Additional DCM training given to the 12 campuses was added to the data gathered. This was formulated into an intensity level and was used to help analyze whether additional DCM trainings impacted a campus' identification as high or low implementer.

Procedures

A field test was conducted using the initial survey instrument. In a field test, "all or some of the survey procedures are tested on a small scale that mirrors the planned full-scale implementation" (National Center for Education Statistics, 2006, Glossary page, ¶ 8). It was sent to a purposefully selected sample of 20 people. Included within that sample were principals, deans, content teachers, special education and ESL teachers, fine arts teachers, and Technical Assistance Providers (TAP). When the pilot surveys were returned, the data were analyzed to see if changes to the instrument were warranted. Minor revisions were made and the final survey was sent to the deputy superintendent of Instructional Services for approval.

After receiving permission from the deputy superintendent to proceed with the DCM survey (see Appendix F), a request was sent from that same office to sub-area superintendents to ask if they would be interested in taking part in the survey (see Appendix B). Out of the six sub-areas, five responded to the request. The DCM survey online link was e-mailed to the principals and deans of instruction of the schools in the five areas that responded positively to the request (see Appendix C). The five areas comprised of 162 schools that could choose to take part in the survey. The e-mail requested that principals and deans make the survey link available to their campus teachers. The survey link was available both through e-mail and on the DCM data web page.

A 14-day time window was allocated to complete the survey. A second e-mail was sent to sub-area superintendents to remind them of the survey and to ask for their support by encouraging their campuses to complete it. The informed consent letter was also attached to the e-mail (see Appendix E). The letter stated that, by returning the completed survey, consent was assumed. Confidentiality was maintained and protected by the researcher. The records were kept by the researcher in a locked file and in a non-networked computer.

After the window of time had closed, campus response was checked. An e-mail reminder with a deadline extension of two more days was sent to campuses that had not responded. A third e-mail was sent out to remind principals of the survey (see Appendix D). At the end of the survey period, 121 campuses out of a possible 162 (75%) had responded with at least one participant. Of those 121 campuses, 92 (76%) were elementary, and 29 (24%) were secondary schools.

When the survey data on campus participation were assessed, it was decided that campuses would be selected from the elementary level because of their high response rate of 92 schools (76%). Purposeful selection techniques were used to identify the 12 elementary campuses. Campuses were then identified as high and low implementers (six each) based on the following criteria: (a) percentage of staff numbers participating in the survey and (b) mean number of choices for survey items 3, 6, and 7.

The selection began by sorting the database of respondents by the percent of staff who took the survey and then by the number of staff who took the survey. A campus with 35% participation and 31 staff members taking the survey was determined to be more suitable for inclusion in the study than a campus with 43% participation and 17 staff who participated, because the study was interested in having the participation of as many campus professionals as possible.

In addition to the percent of campus staff who participated, levels of implementation of DCM were assessed. Six campuses with high levels of DCM implementation and six with low levels of implementation were selected. Levels of implementation were determined by looking at survey items 3, 6, and 7 by campus. The three items measured (a) the participants' understanding of the DCM tools and process, (b) the use of the DCM tools and process, and (c) whether they felt the DCM process had an impact on their student achievement. Survey items 3, 6, and 7 listed data analysis tools and processes that were recommended and reinforced through DCM training. The number of choices selected for each question were aggregated by school and a mean number of choices was computed.

Demographic data were reported for the 12 schools (see Table 1). This included total enrollment and percentages of (a) students receiving free- or reduced-priced lunch, (b) limited English proficiency (LEP), (c) Talented and Gifted (TAG), and (d) special education students. Ethnic composition was also reported.

The student demographic data on each of the 12 campuses selected for this study are shown in Table 5. Out of the 12 campuses, 10 were 58% or more Hispanic, and the other two had a more congruent composition of White, African American, and Hispanic students. Of the Hispanic campuses, 6 of the 10 were 47% or more limited English proficient (LEP). All 12 campuses had a special education population between 1% and 9%, all within the expected range.

Table 1

Demographic Data for the 12 Selected Campuses

	Total Enrollment	Free Lunch	White		Af. Am.		Hispanic		LEP		TAG		Special ED	
		%	#	%	#	%	#	%	#	%	#	%	#	%
High 1	993	90	2	1	36	4	954	96	630	64	54	6	38	4
High 2	623	95	13	2	43	7	540	87	381	62	31	5	51	9
High 3	471	63	175	38	125	27	162	35	56	12	37	8	5	1
High 4	487	83	9	2	191	40	279	58	139	29	78	16	33	7
High 5	203	97	0	0	42	21	161	80	58	29	0	0	13	8
High 6	690	97	9	2	33	5	633	92	376	55	74	11	52	8
Low 1	767	92	15	2	92	12	660	86	332	44	29	4	46	6
Low 2	705	85	11	2	25	4	659	94	345	49	35	5	39	6
Low 3	831	89	3	1	5	1	821	99	388	47	64	8	50	6
Low 4	552	86	68	13	77	14	404	74	194	36	57	11	44	8
Low 5	702	76	320	46	79	12	300	43	127	18	40	6	43	7
Low 6	814	97	9	3	24	13	781	96	401	50	60	8	29	4

When analyzing the data, survey questions were grouped in three ways. The first way was the selection of high and low implementation campuses. The survey questions were used in the selection of campuses by using the number of participants and the percentage of participating staff members and by the mean number of total options chosen on survey items 3, 6, and 7. Once the high participation campus data were sorted, the six high and six low implementation campuses were selected by looking at the means of the total options chosen by participants.

The second manner was by subsets of the survey questions that emerged based on the themes (see Table 2). The factor themes were (a) understanding the DCM process and tools, (b) implementation of the process and tools, (c) collaborative/reflective practice, and (d) professional development. In addition to the original seven research questions established at the onset of this project, three research sub-questions were created to investigate the factor themes generated from the survey responses. The three factor research sub-questions also asked the following:

1. What was the mean score for each factor by school and type of respondent?
2. Can using mean scores on factors predict TAKS passing rates or mean scale score by factors grouping all 12 campuses together?
3. Did low and high implementation schools score differently on the factors?

Table 2

Survey Questions that Aligned with Each Factor Before Cronbach's Coefficient Alpha was Computed

	Understanding of the DCM Process & Tools	Implementation of the Process & Tools	Collaborative/ Reflective Practice	Professional Development
Survey Questions	4, 6, 10, 11, 12	3, 5, 7, 9, 13, 19, 21	14, 15, 16	8, 17, 18, 22

A Cronbach alpha was run to assess internal consistency reliability on the factors. Cronbach's alpha measures how well a set of items (or variables) measures a single unidimensional latent construct. Technically speaking, Cronbach's alpha is not a statistical test, it is a coefficient of reliability (or consistency). Cronbach's alpha can be written as a function of the number of test items and the average inter-correlation among the items (UCLA Academic Technology Services, 2006).

When internal consistency reliability was computed on the four factors, the data showed that some items were not appropriately placed. Alphas were examined, and several factors were altered based on reliability statistics and the corrected item-total correlation. Factors were revised until Cronbach's alpha was adequate at 0.7 or above. Table 3 shows the revised configuration of items to factors.

Table 3

Survey Questions that Aligned with Each Factor After Cronbach's Coefficient Alpha was Computed

	Understanding of the DCM Process and Tools	Implementation of the Process & Tools	Collaborative/ Reflective Practice	Professional Development
Survey Questions	10, 11, 12	5, 9, 13, 19, 20	4, 14, 15, 16	8, 17, 18, 21

The third way to analyze the data was by the seven original research questions, which were answered by specific survey questions. They were answered after the selection had been made of the six low implementation campuses and the six high implementation campuses.

A hypothesis was also stated. The researcher hypothesized that there was a statistically significant difference in TAKS passing rates between high and low implementation schools after using the Data Collaborative Model for a 3-year period of time.

Research Question 1: What is the relationship for teachers between the self-reported (based on the survey results) understanding versus actual use of common and continuous assessment? High and low implementation schools were compared using Cross Tabulations to assess differences in survey responses 4, 6, and 7, which asked whether teachers understood and actually used the DCM tools. The rationale was that if teachers understood common and continuous assessments, then they would have a high level of usage of the DCM tools.

Research Question 2: What impact does regularly scheduled teacher reflection on data have on student achievement? This was answered by regressing the responses from survey item 20, the Collaborative and Reflective factor scores, and Usage Type on high and low TAKS reading and math percent passing rate changes from 2003 to 2006. The Collaborative and Reflective factor and Usage Type were the independent variables and TAKS growth was the dependent variable.

Research Question 3: What is the relationship between job-embedded professional development and student achievement? The Professional Development factor score was used along with Usage Type to predict TAKS passing rates using regression analysis to answer this question. The Professional Development factor and Usage Type were the independent variables and TAKS growth was the dependent variable.

Research Question 4: What impact does the use of the DCM have on student achievement over a period of 3 years? Survey items 14, 16, 17, and 20 were used to answer this question. Responses to these items were used in a repeated measures ANOVA to observe potential relationships with TAKS passing rates. The survey items were the independent variable and the dependent variables were TAKS gains in passing from 2002 to 2003, 2003 to 2004, and 2004 to 2005.

Research Question 5: Does exposure to a model that uses data analysis to impact instruction result in a change in the usage of the district’s online data web? This question was answered by analyzing the 2 years (2004-2006) of available web usage data by campus. Frequency of usage for high and low implementation schools were contrasted using percentages.

Research Question 6: Is there a difference in DCM usage perception between campus administrators and teachers? Survey items 3, 6, 7, 8, 9, 13, 15, 16, 19, and 20, which compared administrator to teacher answers on the same campus, were used to answer this question. Differences in mean principal ratings and teacher ratings were compared using a multiple regression with the ratings as the dependent variable and rater type (principal or teachers) and implementation level as the independent variables. Effect sizes were determined using Cohen's effect size statistics: f^2 for regression analysis and η^2 for analysis of variance. These values reflect the proportion of variance in academic indicators explained by the independent variable(s) divided by the proportion of variance attributed to error (R2/1-R2), or how much of the variance in DCM usage perception between teachers and administrators can be explained by DCM tools and processes (Newton & Rudestam, 1999). There are only "rules of thumb" as to what values make an effect size of practical significance. Cohen (1988) suggested values of $f^2 = 0.02$ as small, 0.15 as medium, and 0.35 as large effect sizes, or $\eta^2 = 0.10$ as small, 0.25 as medium, and 0.40 as large effect sizes.

Research Question 7: What impact does the principal have on the implementation of the DCM model? This question was answered by comparing survey items 6 and 7 selections between the principal and his or her campus teachers. Those items measure the amount of understanding and usage of the data analysis tools on their campus. If teachers and principals each checked five of the eight choices (63%), although perhaps not the same five choices, schools were judged as having both understanding and usage.

DCM Database

Once the 12 campuses that were to be studied were identified from the survey responses, a database was created. The database contained the following information:

1. Campus demographics, including total campus enrollment, socio-economic level, ethnicity, limited English proficiency (LEP), gifted (TAG), and special education status were identified in the database.
2. The sub-area to which the campus was assigned (including if the campus had changed areas within the last 2 years) was labeled. This was important because each sub-area made individual decisions regarding what DCM training they would allow. Some sub-areas did not allow any, while some asked for repeated sessions. Feeder pattern changes occurred three times in the 3 years of this study.
3. Principal turnover rate was included because DCM implementation varied by principal.
4. Additional DCM trainings given to campuses over the last 2 years were recorded. Although the DCM process began in the 2003-2004 school year with the introduction of the benchmark template, the DCM process was not fully developed with continued professional development. In the fall of 2004, a position was created to help implement DCM at a district level.
5. DCM Intensity level was calculated and recorded. First, the number of extra DCM training hours a campus had received over and above the standard training given to all district principals was calculated. This number was multiplied by the intensity factor. An intensity factor was assigned to each

type of training, taking into account who on the campus received the training. If a whole campus received training, it was rated higher than if just the teacher leaders received training. The rationale was that the more campus staff who received the training, the stronger the possibility that it would be implemented. All day sessions with follow up, such as INOVA training, were given the highest intensity factor rating.

6. TAKS reading and math passing rates–Spring 2003 to 2006 reading and math were gathered in order to compare the first year without DCM to the other three with DCM available to the campuses.
7. Data web usage by campus was added to see if there would be a correlation between campuses that use the DCM and their usage of the data web.

Data Analysis

Data were analyzed to provide a general picture of campus understanding and usage of the district's data analysis process and tools. The following explains the different types of questions found on the survey.

Survey item 2 asked each participant to identify himself or herself as a principal, dean, assistant principal, instructional specialist, Technical Assistant Provider (TAP), or teacher. Question 2 was used to create respondent comparison groups to be the independent variable in a one-way analysis of variance. Anonymity was kept by having the teachers fill in only their campus number on their survey and not their names. Teachers were asked to identify more specifically whether they were general education, ESL, special education, or fine arts teachers. The district used this to measure the involvement of different teacher groups in the data analysis process.

For multiple response questions, the following coding system was used: 1 = first answer, 2 = second answer and 3 = third answer, and so forth. Only survey items 3, 6, and 7 required this coding system used specifically to measure the frequency and percent of each response. The remaining questions asked for a single response.

Survey items 4 and 8 through 24 used a six-point Likert scale format. These were coded with 1 = 1, 2 = 2, 3 = 3, 4 = 4, 5 = 5, and 6 = 6. The frequency and percent of each response, as well as the mean, was computed.

Summary and Chapter Overview

Chapter 3 explained the design and methods of this quantitative study. The focus of the study was also stated. Data gathering and data analysis techniques were discussed. The survey instrument was described along with how it was sent out to the participants and how it was analyzed when the responses were returned. The database containing different types of data was also described along with how it was used.

When analyzing the data, survey questions were grouped for analysis in three ways. The first way was the selection of high and low implementation campuses. The second way was by factors, created from subsets of survey questions. The third way was by research questions which were answered by which were answered by specific survey questions and factors.

Chapter 4 contains the results of the data analyses answering the questions posed by the way the survey questions were grouped. Various tables and figures display the statistical results of how the schools were selected, statistical results from the four factors, and the answers for the seven research questions.

Chapter 4

RESULTS

The purpose of this study was to examine the relationship between using the Data Collaborative Model (DCM), a process of instructional improvement using data analysis, and student achievement at 12 campuses in a large urban district. The rationale was that campuses, which have attempted to create and implement a culture of data-driven decision making in a collaborative, reflective setting over a 3-year period of time, would see an increase in teacher effectiveness and student achievement. There were six high implementation campuses and six low implementation campuses selected to be studied in this causal-comparative study based on a survey sent to 162 campuses spread over five district sub-areas.

The research questions were written in collaboration with school district officials who had an interest in the results of the study. Of particular interest to this study were the questions regarding whether the data analysis process that had been in place for 3 years had an impact on student achievement on those campuses that have a high level of implementation of the system.

When analyzing the data, survey questions were grouped for analysis in three ways. The first way was the selection of high and low implementation campuses. The second way was by factors, created from subsets of survey questions. The factors chosen were (a) understanding the DCM process and tools, (b) implementation of the process and tools, (c) collaborative/reflexive practice, and (d) professional development. There were three factor research sub-questions included as well. The third grouping was by the seven research questions.

High and low implementation campuses were selected based on two criteria: (a) the number and the percentage of staff members participating in the survey and (b) the mean number of total options chosen for survey items 3, 6, and 7. More consideration was given to those campuses with a higher number of participating staff versus a high percentage of participating staff. Percentages of participating staff participation rates can be found in Table 4. The high implementation campuses were labeled as High 1 to High 6. The low implementation campuses were labeled Low 1 to Low 6.

Survey items 3, 6, and 7 measured whether participants thought the DCM had an impact on student achievement, whether they understood the components, and finally which tools they actually used during the DCM process, respectively. The means for campus were computed for each question (see Table 5). The six high implementation and six low implementation campuses were selected by first finding the largest participant campus groups that answered the survey, then looking at the means for each of the three questions.

The high implementation campuses had means between 4.8 and 6.5 for survey item 3, between 2.5 and 4.4 for survey item 6, and between 2.4 and 3.7 for survey item 7. The low implementation campuses had means between 2.3 and 5.6 for survey item 3, between 0.9 and 2.8 for survey item 6, and between 0.9 and 2.4 for survey item 7.

Table 4

Staff Participation Rates

	Teachers by Campus	Participating Staff	
		#	%
High 1	78	22	28.2
High 2	48	19	39.6
High 3	33	19	57.6
High 4	43	16	37.2
High 5	21	21	100.0
High 6	62	21	33.9
Low 1	52	15	28.8
Low 2	41	13	31.7
Low 3	50	17	34.0
Low 4	33	17	51.5
Low 5	38	37	97.4
Low 6	58	16	27.6

Table 5

Total Options Chosen on Survey Items 3, 6, and 7 by Campus

	Survey Item 3: DCM has Impact		Survey Item 6: Knowledge of DCM Tools		Survey Item 7: Use the DCM Tools	
	#	Mean	#	Mean	#	Mean
High 1	144	6.5	63	2.9	58	2.6
High 2	91	4.8	66	3.5	54	2.8
High 3	98	5.2	57	3.0	45	2.4
High 4	92	5.8	62	3.9	59	3.7
High 5	100	4.8	52	2.5	42	2.0
High 6	107	5.1	92	4.4	62	3.0
Average–High		5.3		3.4		2.8
Low 1	79	5.3	36	2.4	31	2.1
Low 2	44	3.4	31	2.4	24	1.8
Low 3	96	5.6	47	2.8	40	2.4
Low 4	49	2.9	35	2.1	24	1.4
Low 5	164	4.4	83	2.2	58	1.6
Low 6	36	2.3	14	0.9	14	0.9
Average-Low		3.9		2.1		1.7

Note. N = total options chosen.

Factors

The survey items were grouped into four factors, and Cronbach alpha was calculated for each. When the alphas were run, not all the items within the factors proved reliable. The factors were then revised, and new alphas were computed. The revised factors are found in Table 3 in Chapter 3.

The Understanding factor assessed how well persons surveyed understood the DCM process. The Understanding factor had a Cronbach alpha of 0.759, near the desired range of 0.80 (Leech, Barrett, & Morgan, 2005), and all three Corrected Item-Total Correlation items measured between 0.388 and 0.737, indicating that all the items were good components.

The Implementation factor measured whether campuses implemented the DCM process and tools. The alpha coefficient measured 0.739, which indicates reasonable reliability, with all the Corrected Item-Total Correlation items at acceptable levels of between 0.370 and 0.588.

The Collaborative/Reflective factor measured whether practitioners felt like they were taking part in collaborative and reflective practice on their campus. The Cronbach alpha measured 0.736, indicating adequate reliability, and all the Corrected Item-Total Correlations items were between 0.328 and 0.671.

The Professional Development factor asked educators whether they received professional development by discussing strategies at the collaborative table and by looking at data. The alpha was 0.479 on this factor, which showed inadequate reliability when survey Item 21 (I feel I need more training on the OIR Data Web) was included in the factor. The Cronbach alpha increased to 0.726 when survey item 21 was deleted.

After the data were grouped in this manner, the three research factor sub-questions were answered. Their results follow.

Factor Research Sub-Question 1: What was the mean score for each factor by school and type of respondent? The campus means by factors demonstrate that the high implementation campuses were higher in each factor than the low implementation schools. The mean averages of each implementation type reflect that as well. The higher implementation campuses had a stronger understanding of the Data Collaborative Model and were more likely to use DCM (see Table 6). The campus mean for high implementation campuses, which was the average of the four factors, was 14.1 to 15.6. Low implementation campuses had a range of 8.8 to 13.7.

Table 6

Factor Mean Score by Campus

	Understand Mean	Implement Mean	Collaborative/ Reflective Mean	Professional Development Mean	Campus Mean
High 1	8.9	16.4	17.1	14.5	14.2
High 2	8.8	18.0	18.5	15.0	15.1
High 3	10.7	18.8	18.5	14.4	15.6
High 4	8.8	16.4	17.6	15.9	14.7
High 5	9.6	16.0	16.0	14.9	14.1
High 6	8.3	17.4	18.3	15.2	14.8
Mean–High	9.2	17.2	17.7	15.0	14.8
Low 1	8.8	15.1	16.9	13.8	13.7
Low 2	8.1	13.8	16.5	13.4	8.8
Low 3	7.9	16.0	15.6	14.9	13.6
Low 4	9.0	14.6	13.2	11.2	12.0
Low 5	8.1	13.1	14.7	12.9	12.2
Low 6	7.3	11.4	13.0	12.4	11.0
Mean–Low	8.2	14.0	12.2	13.1	11.9

In every factor except Professional Development, the means showed that the principal understood and used the DCM more than the other categories of campus staff.

The assistant principal had a higher mean in the Professional Development area than all the other categories and was higher on the other three factors when compared to the teacher categories (see Table 7). The difference between principal means and the general education teacher means was significant in the Understand (15.9 – 8.2 = 7.7) and Implement factors (25.9 – 14.7 = 11.2), and less so in the Collaborative/Reflective (20.4 – 16.0 = 4.4) and Professional Development (16.3 – 13.9 = 2.4) factors.

Table 7

Factor Mean Score by Type of Respondent

Respondent	Understand Mean	Implement Mean	Collaborative/ Reflective Mean	Professional Development Mean
Principal	15.9	25.9	20.4	16.3
Assistant Principal	14.2	24.6	20.2	18.6
Instructional Specialist	10.8	16.7	16.8	13.7
Gen. Ed. Teacher	8.2	14.7	16.0	13.9
Fine Arts Teacher	6.7	12.1	14.6	12.0

Note. Factor Mean Score by Campus available in Table 4.

Factor Research Question 2: Can using mean scores on factors predict TAKS passing rates or mean scale score by factors grouping all 12 campuses together? A regression analysis was conducted on both the TAKS reading and TAKS math passing rates for 2003-2006. However, none of the factors were significant predictors (see Table 8).

Table 8

Regression Analysis Using Campus Mean Scores to Predict TAKS

	Unstandardized		Standardized
	B	SE	β
TAKS Reading			
Collaborate	-0.052	0.275	-0.020
Understand	-0.259	0.251	-0.092
Implement	0.277	0.248	0.144
Professional Development	0.020	0.314	0.007
TAKS Math			
Collaborate	0.067	0.277	0.026
Understand	-0.232	0.252	-0.082
Implement	0.246	0.249	0.127
Professional Development	-0.091	0.316	-0.032

Note. Sample size = 237 respondents.

Factor Research Question 3: Did low and high implementation schools score differently on the factors? A univariate analysis of variance was performed on the four factors to see if there was a significant difference between high and low implementation schools (see Table 9).

As shown, there were significant differences between the high and low implementation campuses on all factors except the Understand factor. Most high implementation schools had higher mean factor scores than low implementation schools.

Table 9

Univariate Analysis of Variance Measuring Significant Difference Between High and Low Implementation Campuses

	N	df	MS	F	p	η^2
Collaborate	237	236	456	21.3	<.001	0.08
Understand	237	236	57	3.1	.080	
Implement	237	236	657	17.5	<.001	0.07
Professional Development	237	236	208	12.0	.001	0.05

Of the survey items, 3 out of 21 asked the respondents to choose one or more of the options displayed. Survey items 3, 6, and 7 asked the respondents to choose the action, strategy, or tool that they not only understood, but actually used on their campus. The other 19 survey items were questions with a Likert scale choice. The following is a discussion on the results from survey items 3, 6, and 7.

Survey item 3 asked if the DCM process helped the teacher/administrator understand how to impact instruction. At the high implementation campuses, between 43% and 60% of the participants who answered said they did understand how to impact instruction using the process (see Table 10). At low implementation campuses, between 20% and 51% of the participants said they understood the process. A total average of 49% of the high implementation campuses had respondents who said they understood how to impact instruction through the DCM process, versus 36% for the low implementation campuses.

Survey item 6 asked if the respondent understood how to use the eight DCM tools. Between 20% and 49% of the respondents at the high implementation campuses indicated they knew how to use the tools (see Table 10). At the low implementation campuses, only 10% to 31% of the respondents said they felt they knew how to use the tools. A total average of 31% of the high implementation campus respondents said they actually used the DCM tools versus, 19% for the respondents at the low implementation campuses.

Survey item 7 asked whether the respondents actually used the same eight DCM tools. Of the high implementation campuses, between 22% and 41% of the respondents said they actually used the DCM tools (see Table 10), while only 10% to 26% of the respondents at low implementation campuses actually used the tools.

Table 10

Percentages at the Campuses that Selected the Options Available in Survey Items 3, 6, and 7

	Impact		Understanding		Usage	
	N1	%	N2	%	N2	%
High 1	144	60	63	32	58	29
High 2	91	44	66	39	54	32
High 3	98	47	57	33	45	26
High 4	92	52	62	43	59	41
High 5	100	43	52	28	42	22
High 6	107	46	92	49	62	33
Low 1	79	48	36	27	31	23
Low 2	44	31	31	26	24	21
Low 3	96	51	47	31	40	26
Low 4	49	26	35	23	24	16
Low 5	164	40	83	25	58	17
Low 6	36	20	14	10	14	10

Note. N1 refers to the number of staff who answered the survey multiplied by the total number of choices for Survey item 3, which was 11. Percentage (%) refers to the percent of options possibly chosen out of the total options available (N). N2 refers to the number of staff who answered the survey multiplied by the total number of choices for Survey items 6 and 7, which was eight.

Survey item 3 offered 11 answer choices to show which tools helped participants in their implementation of the DCM process. “Sharing data results with peers” (59%) and “sharing instructional strategies with peers” (59%) was chosen by participants at 10 out of 12 schools as either their first or second choice of most frequently used DCM activities (see Table 11). The choice with the next highest percentage was “meeting regularly to professionally dialogue” (54%). The answers least selected by participants were “taking part in job-embedded professional development” (25%) and “reviewing teacher made tests for rigor and relevancy” (19%).

Table 11

Respondent Breakdown: Survey Item 3

Campus	Analyzing TAKS Reports		Analyzing Benchmark Reports		Meeting Regularly		Sharing Results w/ Peers		Sharing Instruct Strategy		Sharing Ideas and Resources		Review Student Work for Rigor		Review Teacher Made Tests for Rigor		Creating Action Plan for Students Based on Data		Taking Part in Job-Embedded Prof. Dev		Using other DCM Tools	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
High 1	18	15.0	13	11.1	16	12.6	18	12.9	17	12.2	14	12.0	6	10.2	8	18.2	14	16.7	8	12.7	12	13.2
High 2	10	8.3	11	9.4	11	8.7	9	6.5	11	7.9	7	6.0	5	8.5	3	6.8	7	8.3	6	9.5	11	12.1
High 3	11	9.2	9	7.7	14	11.0	15	10.8	14	10.1	11	9.4	6	10.2	4	9.1	6	7.1	2	3.2	6	6.6
High 4	11	9.2	13	11.1	7	5.5	12	8.6	10	7.2	9	7.7	5	8.5	6	13.6	6	7.1	5	7.9	8	8.8
High 5	10	8.3	14	12.0	11	8.7	14	10.1	13	9.4	15	12.8	3	5.1	2	4.5	7	8.3	4	6.3	7	7.7
High 6	10	8.3	9	7.7	16	12.6	12	8.6	14	10.1	9	7.7	9	15.3	5	11.4	8	9.5	7	11.1	8	8.8
Low 1	9	7.5	7	6.0	9	7.1	9	6.5	9	6.5	9	7.7	4	6.8	2	4.5	7	8.3	7	11.1	7	7.7
Low 2	5	4.2	6	5.1	4	3.1	5	3.6	6	4.3	4	3.4	2	3.4	2	4.5	5	6.0	3	4.8	2	2.2
Low 3	11	9.2	12	10.3	10	7.9	12	8.6	12	8.6	9	7.7	9	15.3	2	4.5	7	8.3	5	7.9	7	7.7
Low 4	4	3.3	4	3.4	7	5.5	8	5.8	7	5.0	6	5.1	0	0.0	0	0.0	5	6.0	3	4.8	5	5.5
Low 5	17	14.2	18	15.4	17	13.4	20	14.4	21	15.1	18	15.4	8	13.6	9	20.5	11	13.1	10	15.9	15	16.5
Low 6	4	3.3	1	0.9	5	3.9	5	3.6	5	3.6	1	0.9	2	3.4	1	2.3	1	1.2	3	4.8	3	3.3
Total	120	100	117	100	127	100	139	100	139	100	117	100	59	100	44	100	84	100	63	100	91	100
Rank Order	4		5.5		3		1.5		1.5		5.5		10		11		8		9		7	

Of the eight choices offered for survey item 6, the tool selected by the participants at the 12 schools almost twice as many times as the next tool was the Classroom Profile (68%), followed by the Vertical Alignment Form (37%) (see Table 12). The third highest tool selected was the Content Area Guiding Questions (35%), which were sent out by the content directors for teachers to reflect on for each early release day. The tools least chosen were the Learning Log (27%) and the Cycle of Inquiry (10%). A total average of 37% of the respondents at the high implementation campuses said they understood how to use the eight DCM tools listed, versus 24% for the low implementation campuses.

Table 12

Respondent Breakdown: Survey Item 6

	TAKS Reflect Tools		Pre-slugged Templates		Vertical Form		Content Area Guiding Questions		Student Profile		Cycle of Inquiry		Classroom Profile		Learn Log		Total Chosen	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
High 1	7	11.7	8	11.1	8	9.2	7	8.3	11	14.1	1	4.2	17	10.6	4	6.3	63	9.9
High 2	7	11.7	11	15.3	9	10.3	7	8.3	8	10.3	1	4.2	15	9.4	8	12.7	66	10.3
High 3	10	16.7	8	11.1	5	5.7	9	10.7	8	10.3	0	0.0	14	8.8	3	4.8	57	8.9
High 4	9	15.0	6	8.3	10	11.5	10	11.9	6	7.7	3	12.5	12	7.5	6	9.5	62	9.7
High 5	4	6.7	6	8.3	8	9.2	8	9.5	7	9.0	1	4.2	15	9.4	3	4.8	52	8.2
High 6	7	11.7	8	11.1	17	19.5	11	13.1	12	15.4	7	29.2	19	11.9	11	17.5	92	14.4
Low 1	3	5.0	6	8.3	8	9.2	6	7.1	1	1.3	0	0.0	8	5.0	4	6.3	36	5.6
Low 2	2	3.3	4	5.6	3	3.4	4	4.8	6	7.7	1	4.2	7	4.4	4	6.3	31	4.9
Low 3	6	10.0	4	5.6	1	1.1	7	8.3	5	6.4	3	12.5	15	9.4	6	9.5	47	7.4
Low 4	2	3.3	5	6.9	5	5.7	4	4.8	3	3.8	1	4.2	12	7.5	3	4.8	35	5.5
Low 5	11	18.3	5	6.9	12	13.8	10	11.9	9	11.5	3	12.5	23	14.4	10	15.9	83	13.0
Low 6	2	3.3	1	1.4	1	1.1	1	1.2	2	2.6	3	12.5	3	1.9	1	1.6	14	2.2
Total	60	100	72	100	87	100	84	100	78	100	24	100	160	100	63	100	638	100
Rank Order	6		5		2		3		4		8		1		7			

For survey item 7, participants were asked to select the tools that they actually used. The Classroom Profile (60%) was again chosen by more teachers and administrators than any other (see Table 13), with a similar response rate as in survey item 6. Content Area Guiding questions were chosen by 28% and the Pre-slugged Templates by 27%. The two least used items were the Learning Log (18%) and the Cycle of Inquiry (5%). This was similar to the level of understanding found for survey item 6.

Table 13

Respondent Breakdown: Survey Item 7

	TAKS Reflection Tools		Pre-slugged Templates		Vertical Form		Content Area Guiding Questions		Student Profile		Cycle of Inquiry		Classroom Profile		Learn Log		Total Chosen	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
High 1	7	11.9	9	13.8	4	6.3	5	8.2	11	16.4	0	0.0	18	12.7	4	9.5	58	11.4
High 2	5	8.5	8	12.3	11	17.5	4	6.6	7	10.4	0	0.0	13	9.2	6	14.3	54	10.6
High 3	9	15.3	7	10.8	3	4.8	5	8.2	8	11.9	0	0.0	11	7.7	2	4.8	45	8.8
High 4	9	15.3	7	10.8	8	12.7	10	16.4	8	11.9	2	16.7	10	7.0	5	11.9	59	11.5
High 5	3	5.1	5	7.7	5	7.9	7	11.5	6	9.0	1	8.3	14	9.9	1	2.4	42	8.2
High 6	7	11.9	6	9.2	11	17.5	8	13.1	6	9.0	4	33.3	12	8.5	8	19.0	62	12.1
Low 1	2	3.4	4	6.2	7	11.1	4	6.6	2	3.0	0	0.0	10	7.0	2	4.8	31	6.1
Low 2	3	5.1	4	6.2	1	1.6	2	3.3	3	4.5	2	16.7	6	4.2	3	7.1	24	4.7
Low 3	3	5.1	4	6.2	1	1.6	7	11.5	7	10.4	2	16.7	11	7.7	5	11.9	40	7.8
Low 4	3	5.1	3	4.6	3	4.8	2	3.3	3	4.5	1	8.3	8	5.6	1	2.4	24	4.7
Low 5	6	10.2	6	9.2	6	9.5	7	11.5	6	9.0	0	0.0	24	16.9	3	7.1	58	11.4
Low 6	2	3.4	2	3.1	3	4.8	0	0.0	0	0.0	0	0.0	5	3.5	2	4.8	14	2.7
Total	59	100	65	100	63	100	61	100	67	100	12	100	142	100	42	100	511	100
Rank Order	6		3		4		5		2		8		1		7			

The second manner of grouping the survey questions corresponded with the research question answered. Their results follow:

Research Question 1: What was the relationship for teachers between the self-reported (based on the DCM survey results) understanding versus actual use of common and continuous assessment? Survey items 4, 6, and 7 were used to answer this question. Survey item 4 asked the participant to indicate, on a Likert scale, his or her understanding of the need for common and continuous assessments.

Of the respondents, 56% agreed or strongly agreed that they understood the need for common and continuous assessments (see Table 14). When the response option "somewhat agreed" was added to the previously mentioned categories, total respondents who somewhat agreed to strongly agreed that they understood the need for common and continuous assessments increased to 78%.

Table 14

Frequency Descriptive of Survey Item 4

	#	%
Strongly Disagree	10	4.2
Disagree	11	4.6
Somewhat disagree	29	12.2
Somewhat agree	52	21.9
Agree	64	27.0
Strongly Agree	69	29.1
No Response	2	0.8

Responses to survey item 6 (use the tool) and 7 (understand the tool) were divided into four categories based on the combination of levels of usage and understandings: do not use, do not understand; use, do not understand; do not use, understand; use, understand. Their ratings of the eight DCM tools are found in Table 15.

Of the respondents, 53% not only understood the Classroom Profile tool, but actually used it as well (see Table 15). Another tool that was used and understood was the Pre-Sluggged Template (24.5%). The least understood and used were the Learning Log (12.7%) and the Cycle of Inquiry (4%).

Table 15

Participants' Reported Understanding and Uses of the Eight DCM Tools

	Do Not Use, Do Not Understand		Use, Do Not Understand		Do Not Use, Understand		Use, Understand	
	#	%	#	%	#	%	#	%
TAKS Reflection Tools	156	65.8	22	9.3	11	4.5	48	20.0
Pre-Slugged Templates	158	66.7	14	5.9	7	2.9	58	24.5
Vertical Alignment Form	142	17.7	32	13.5	8	3.4	55	23.0
Guiding Questions	141	59.5	35	14.8	12	5.1	49	20.6
Student Profiles	140	59.1	30	12.7	19	8.0	48	20.0
Cycle of Inquiry	212	89. 5	13	5.5	1	0.05	11	4.6
Classroom Profile	61	25.7	34	14.3	16	6.8	126	53.0
Learning Log	162	68.4	33	13.9	12	5.1	30	12.7

In order to present the research and results for Research Questions 2, 3, and 4, the following data are offered as a necessary precursor to those questions. In each of these questions, TAKS passing rates were assessed by high and low DCM implementation for the years 2003-2006. Then, research questions 2, 3, and 4 were analyzed by their unique theme, which involved varied survey items.

TAKS reading passing rates were analyzed using one-way repeated measures ANOVA. This analysis revealed no significant between-subjects effect for Usage Type (see Table 13). TAKS reading passing rates were significantly higher in 2006 than in 2003, $F\ (1.58, 370.26) = 507.85$, $p < .001$, $\eta^2 = 0.68$, but Usage Type had no statistically significant effect on the increase in passing rates.

Across time, there were significant within-group differences from year to year for campuses within the high and low implementation groups. For example, some low implementation campuses made significant gains, while others in the same group made few gains (see Table 16).

Table 16

Repeated Measures ANOVA Summary Table for Effect of Usage Type on TAKS Reading Percent Passing

	df	SS	MS	F	p	η^2
Between						
Usage Type	1.00	41.05	41.05	0.54	0.46	
Within	373.42					
Reading	1.58	53358.83	33866.13	507.85	0.00	0.68
Reading*Usage	1.58	869.19	551.66	8.27	0.00	0.03
Residual	370.26	24691.01	66.69			
Total	374.41					

As shown in Table 17, the high implementation campuses had approximately the same steady gain as the low implementation campuses from 2003 to 2005 for TAKS reading. A difference appears in the fourth year, with the high implementation campuses having a gain of 7.19% passing from 2005 to 2006 versus 2.41% for the low implementation campuses. The interaction effect for TAKS reading passing rate and Usage Type is significant within groups, which means there were some campuses within the group of 12 that did have some significant gains.

Although the high and low groups differed by only 0.91% (61.44 – 60.53 = 0.91), with low implementation campuses having the slightly higher mean in 2003, by the end of the fourth year (2006), the high implementation campuses had a mean gain percent passing that was 3.66% (83.03 – 79.37 = 3.66) higher. Although that group had strong gains from 2003 to 2004 of 11.13% (see Table 17), the increase dropped to 4.18% then increased again 7.19% by 2005. The low implementation group had a steady drop in gain beginning with 9.36% in 2004, 6.16% in 2005, and 2.41% in 2005. Mean TAKS reading percent passing scores from 2003-2006 are also displayed in Table 17.

Table 17

Mean Percent Passing and Mean Gains for TAKS Reading 2003-2006 by Campus Type

	Year	Mean	Mean Gains
High Implementation Campuses	2003	60.53	
	2004	71.66	11.13
	2005	75.84	4.18
	2006	83.03	7.19
Low Implementation Campuses	2003	61.44	
	2004	70.80	9.36
	2005	76.96	6.16
	2006	79.37	2.41

The high implementation group's gains in TAKS reading passing rate were lower between 2004 and 2005 (see Figure 1). The significant gain by the high implementation campuses can be seen in 2005-2006.

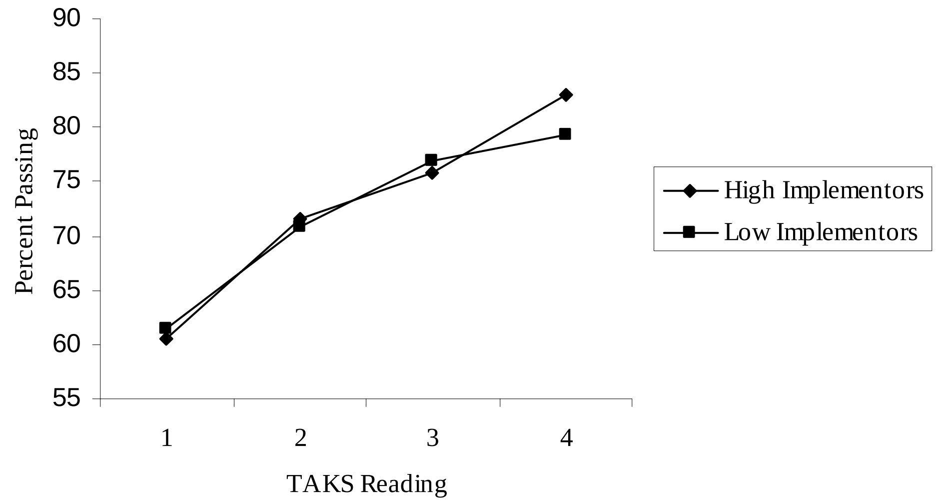

Figure 1. Mean TAKS reading percent passing rates, 2003-2006.

TAKS mathematics passing rates were analyzed using a one-way repeated measures ANOVA. This analysis revealed a significance between-subjects effect for Usage Type F (1, 235) = 21.59, $p < .001$, $\eta^2 = 0.08$ (see Table 18). TAKS math passing rates were significantly higher in 2006 than in 2003: F (1.7, 400.21) = 780.6, $p < .001$, $\eta^2 = 0.77$. The effect size of $\eta^2 = 0.77$ indicates that the difference in TAKS math passing rate is of high practical significance. There was also an interaction effect with TAKS math passing rate and Usage Type. The contrasts of tests within-subjects show that the difference in TAKS math passing rate with Usage Types were significant between 2003-2004 and 2005-2006.

Table 18

Repeated Measures ANOVA Summary Table for Effect of Usage Type on TAKS Math Percent Passing

	df	SS	MS	F	p	η^2
Between						
Usage Type	1.00	1940.00	1940.00	21.59	0.00	0.08
Within	403.61					
Math	1.70	85322.16	50100.04	780.60	0.00	0.77
Math*Usage	1.70	1610.91	945.90	14.74	0.00	0.06
Residual	400.21	25686.17	64.18			
Total	404.61					

High implementation campuses showed significant gains from 2003 to 2006. Although there was a 3.25% difference in means between each campus group in 2003, the gap had widened to 10.1% by 2006 (see Table 19). The interaction effect, “Math and Usage,” was significant for gains during the years of 2003-2004 and 2005-2006.

Low implementation campuses had math gains as well, although not as high as the high implementation campuses. Whereas the high implementation group had a higher increase than the year before (8.51% gain), the low implementation group had smaller gains each year. There was a 13.16% gain from the 2003 to 2004 for the low implementation campuses. This was 2.07% less than the high implementation campuses. There was a 6.22% gain from 2004 to 2005 and only a 2.72% gain from 2005 to 2006 (see Table 19).

Table 19

Mean Percent Passing and Mean Gains for TAKS Math 2003-2006 by Campus Type

	Year	Mean	Mean Gains
High Implementation	2003	55.90	
Campuses	2004	71.13	15.23
	2005	76.30	5.17
	2006	84.81	8.51
Low Implementation	2003	52.65	
Campuses	2004	65.81	13.16
	2005	72.03	6.22
	2006	74.75	2.72

Although the high implementation group's math means were always higher than low implementation group's means (see Figure 2), differences in mean percent passing rates between the two groups were significant only from 2003 to 2004 and from 2005 to 2006, as confirmed by the one-way repeated measures ANOVA. The increase in gains was not as high between 2004 and 2005, with the high implementation campuses showing only a 5.17% gain. That compared to the 15.23% gain the previous year, and an 8.51% gain from 2005 to 2006. The low implementation group had smaller gains each year as shown in Figure 2, from a high of 13.16% in 2004 down to 2.72% in 2006.

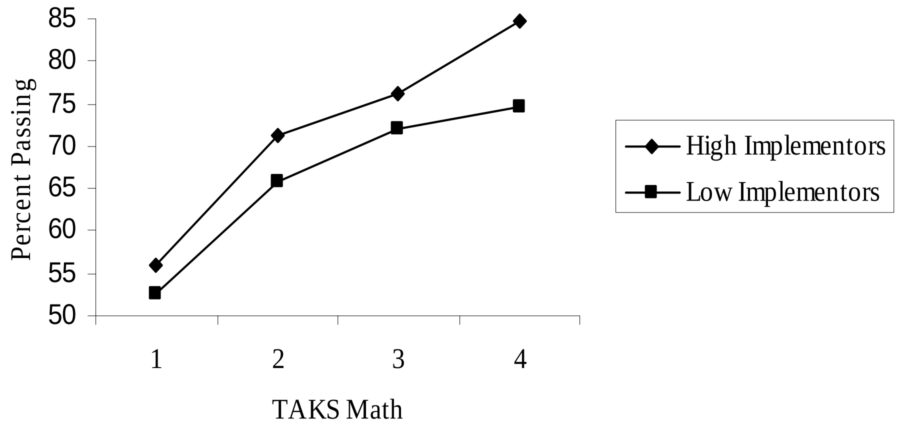

Figure 2. Mean TAKS math percent passing rates, 2003-2006.

Research Question 2: What impact does regularly scheduled teacher reflection of data have on student achievement? To answer this question, the responses to survey item 20, the Collaborative and Reflective factor scores, and Usage Type on TAKS reading and math percent passing rates over the years 2003 to 2006 were used.

When TAKS reading passing rates were analyzed using one-way repeated measures ANOVA with survey item 20 and Collaborate as covariates, there were no significant between-subject effects (see Table 20). The teachers' perception of student performance accounted for no variation in student achievement scores between high and low implementation campuses.

Table 20

Repeated Measures ANOVA Summary Table for Effect of Usage Type, Perception of Student Performance, Survey Item 20, and the Collaboration Factor on TAKS Reading Percent Passing

	df	SS	MS	F	p	η^2
Between						
Collaborate	1.00	253.41	253.41	3.33	0.07	
SI_20	1.00	168.26	168.26	2.21	0.14	
Usage Type	1.00	41.05	41.05	0.54	0.46	
Within	371.41					
Reading	1.57	3909.96	1303.32	37.05	0.00	0.14
Reading*Collaborate	1.57	63.17	40.31	0.60	0.51	
Reading*SI_20	1.57	23.01	14.68	0.22	0.75	
Reading*Usage Type	1.57	796.45	508.23	7.55	0.00	0.03
Residual	365.13	24588.64	67.34			
Total	374.41					

Note. Survey Item 20: Answer this question only if your campus uses the DCM: Since we began using the DCM, I have seen an improvement in student performance.

A significant difference was not found in TAKS math passing rates between the high and low implementation groups using the Collaborative factor and survey item 20 in the between-subject tests (see Table 21). Nor was a significant difference found in the within tests in those same math factors.

Table 21

Repeated Measures ANOVA Summary Table for Effect of Usage Type, Perception of Student Performance, Survey Item 20, and the Collaboration Factor on TAKS Math Percent Passing

	df	SS	MS	F	p	η^2
Between						
Collaborate	1.00	285.01	285.01	3.19	0.08	
SI_20	1.00	156.17	156.17	1.75	0.19	
Usage Type	1.00	966.46	1966.46	22.00	0.00	0.09
Within	402.98					
Math	1.70	7165.88	4214.39	65.68	0.00	0.22
Math*Collaborate	1.70	144.28	84.85	1.32	0.27	
Math*SI_20	1.70	164.06	96.49	1.50	0.23	
Math*Usage Type	1.70	1390.14	817.57	12.74	0.00	0.05
Residual	396.18	25421.92	64.17			
Total	405.98					

Research Question 3: What is the relationship between job-embedded professional development and student achievement? This research question was answered by using the Professional Development factor. This factor was comprised of survey items 8, 17, 18, and 21, which asked if the respondent felt the DCM tools and strategies learned during the collaborative process were impacting student achievement. The Professional Development factor did not account for the variance in the dependent variable TAKS reading or math passing rates.

When TAKS reading passing rates were analyzed using one-way repeated measures ANOVA with Professional Development as a covariate, Professional

Development was non-significant (see Table 22). The only significant within-subject effect was for Usage Type, as discussed in the introduction prior to Research Question 2.

Table 22

Repeated Measures ANOVA Summary Table for Effect of Usage Type, Perception of Student Performance, and the Professional Development Factor on TAKS Reading Percent Passing

	df	SS	MS	F	p	η^2
Between						
Professional Development	1.00	47.57	47.57	0.62	0.43	
Usage Type	1.00	38.59	38.59	0.50	0.48	
Within	373.45					
Reading	1.57	3909.96	1303.32	37.05	0.00	0.14
Reading*Professional Development	1.57	19.89	19.89	0.19	0.78	
Reading*Usage Type	1.57	807.85	807.85	7.66	0.00	0.03
Residual	370.26	24691.01	66.69			
Total	375.45					

When TAKS math passing rates were analyzed using one-way repeated measures ANOVA with Professional Development as a covariate, Professional Development was non-significant (see Table 23). The significant between-subject effect was for Usage Type, as discussed in the introduction prior to Research Question 2. The within-subject effect was non-significant for Professional Development.

Table 23

Repeated Measures ANOVA Summary Table for Effect of Usage Type, Perception of Student Performance, and the Professional Development Factor on TAKS Math Percent Passing

	df	SS	MS	F	p	η^2
Between						
Professional Development	1.00	63.72	63.72	0.71	0.40	
Usage Type	1.00	2000.02	2000.02	22.23	0.00	0.09
Within	403.23					
Math	1.70	7035.54	4135.14	64.13	0.00	0.22
Math* Professional Development	1.70	15.05	8.85	1.37	0.84	
Math*Usage Type	1.70	1552.50	912.48	14.15	0.00	0.06
Residual	398.13	25421.92	64.48			
Total	405.23					

Research Question 4: What impact does the use of the DCM have on student achievement over a period of 3 years? The data in Table 24 show the increase in the percentage of students passing the state assessment (TAKS) in reading beginning the second year after TAKS was introduced. The high implementation campuses had between a 29% and 71% increase. The low implementation campuses had between a 6% loss in percent passing to a 79% increase. The average percent gain for the high implementation campuses in reading was 38%, versus 47% for the low implementation campuses.

Table 24

Gains and Losses per Campus for TAKS Reading and Math from Spring 2003 to Spring 2006

	DCM Exposure Intensity Factor	Gain						Three Year Total Percent Increase	
		2003-2004		2004-2005		2005-2006			
		R	M	R	M	R	M	R%	M%
High 1	42	19	19	13	8	0	3	71	65
High 2	42	6	3	5	5	6	15	29	49
High 3	9	4	11	5	5	11	19	29	61
High 4	6	9	14	1	10	8	6	27	58
High 5	8	19	22	-10	3	12	2	30	30
High 6	41	8	21	10	7	7	7	45	66
Low 1	15	7	9	8	0	7	6	48	36
Low 2	24	13	22	11	11	7	5	54	78
Low 4	32	15	7	14	17	4	5	70	68
Low 3	15	14	12	3	8	5	6	34	45
Low 5	8	13	19	0	1	-8	5	-6	4
Low 6	21	12	27	11	11	13	9	79	188
District	8	11	12	5	4	5	6	37	51
State	N/A	7	7	3	5	4	4	19	27

Note. Data are based on Panel Recommendation percent passing for each year since TAKS began in 2003. R = Reading. M = Math.

Table 24 also shows the increases in student performance on the state assessment in math beginning the second year after TAKS was introduced. The high implementation campuses had between a 30% and 66% increase. The low implementation campuses had between a 4% and 79% increase. The average percent gain for the high implementation campuses in math was 53%, versus 69% for the low implementation campuses.

DCM exposure, which was how much extra DCM training a campus received over and above the standard district-wide training given to principals each year, was documented (see Table 25). Intensity level was calculated by multiplying the number of hours a campus had received in addition to the DCM training given to all district principals at the beginning of each school year by the intensity factor assigned. The length of the training and the audience determined the intensity factor. For example, if an all-day training was given to the campus leadership team with the principal present, it received a higher intensity level than one-hour campus training.

Table 25

DCM Trainings Available to Campus Professional Personnel during 2004-2006 Including Intensity Level

	Training Time	Intensity Level
1. Sub-area CILT Meeting	3 hrs	4
2. Sub-area Principal Training	1 hr	3
3. Campus-wide Training	1 hr	3
4. Reading First Coaches' Training	1 hr	2
5. Feeder Pattern Principal Meeting	1 hr	2
6. Meet with Principal/Admin. Team	1 hr	2
7. INOVA Training	7 hrs	5
8. District-wide Principal Training	3 hr	4

Those campuses with total intensity levels between 6 and 15 had between a 6% loss to a 37% gain in reading scores and between 4% to 61% gain in math scores (see Table 24). Campuses with total intensity levels between 21 and 42 had 3-year gains ranging from 29% to 79% in reading and between 41% and 188% in math. Almost all campuses showed strong gains over the 4-year history of the TAKS test, with 6 out of 12 campuses having 45% or more gains in percent passing in reading and 8 out of 12 in math.

Although all campuses were exposed in some varying degrees to the DCM and all campuses showed gains through published passing rates, survey items 14, 16, 17, and 20 were not shown through statistical tests to impact TAKS gains. These items measured the level of implementation of DCM versus TAKS passing rates. Separate one-way repeated measures ANOVA analyses were performed on TAKS passing rates with each survey question as a covariate, as seen in Tables 27 through 34. Statistical tests showed the interaction effect of passing rates and survey items 14, 16, 17, and 20 to be statistically non-significant. Those questions did not significantly account for the variation in gains on TAKS passing rates, as can be seen from Tables 27 through 34.

Survey item 14 asked respondents if they met regularly with peers to collaborate on student performance results. The variable did not account for the variance in the dependent variable, TAKS reading passing rates. Survey item 14 was non-significant and did not account for the variance in TAKS reading passing rates (see Table 26). However, the within-subjects contrasts tests were significant, as discussed in the introduction prior to Research Question 2.

Table 26

Repeated Measures ANOVA Summary Table for Effect of Usage Type and Survey Item 14 on TAKS Reading Percent Passing

	df	SS	MS	F	p	η^2
Between						
SI _14	1.00	121.74	121.74	1.59	0.21	
Usage Type	1.00	54.90	54.90	0 .72	0.40	
Within	372.57					
Read	1.57	6694.32	4258.32	63.55	0.00	0.21
Read* SI _14	1.57	41.39	26.33	0.39	0.63	
Residual	367.86	24649.62	67.01			
Total	374.57					

Survey item 16 asked respondents if they regularly implemented the strategies learned at the collaborative table. The variable did not account for the variance in the dependent variable, TAKS reading passing rate (see Table 27). However, across time, the within-subjects gains in reading were significant, $F(1.57, 371.92) = 57.65$, $p < .001$, $\eta^2 = 0.198$.

Table 27

Repeated Measures ANOVA Summary Table for Effect of Usage Type and Survey Item 16 on TAKS Reading Percent Passing

	df	SS	MS	F	p	η^2
Between						
SI _16	1.00	128.69	128.69	1.69	0.2	
Usage Type	1.00	5.77	59.77	1.69	0.38	
Within	371.92					
Read	1.58	6025.81	3823.52	57.65	0.00	0.2
Read* SI _16	1.58	230.06	146.00	2.20	0.12	0.01
Read*Usage Type	1.58	747.04	474.01	7.15	0.00	0.03
Residual	368.78	24460.96	66.33			
Total	373.92					

Teachers’ perceptions of learning at the collaborative table for survey item 17 was significant and accounted for differences in TAKS reading passing rates: $F(1, 373.17) = 2.75$, $p = .01$, $\eta^2 = 0.01$ (see Table 28). Those with more positive perceptions of the effectiveness of the strategies learned at the collaborative table had higher TAKS reading passing rates. However, the effect size ($\eta^2 = .01$) indicated that the difference was of little practical significance. The within-subjects difference in reading was also significant, $F(1.58, 370.10) = 48.43$, $p < .001$, $\eta^2 = 0.171$, but the interaction effect of reading with survey item 17 was non-significant.

Table 28

Repeated Measures ANOVA Summary Table for Effect of Usage Type and Survey Item 17 on TAKS Reading Percent Passing

	df	SS	MS	F	p	η^2
Between						
SI _17	1.00	208.85	208.85	2.8	0.01	0.01
Usage Type	1.00	73.78	73.78	0.97	0.33	
Within	373.17					
Read	1.58	5060.65	3199.68	48.43	0.00	0.17
Read* SI _17	1.58	237.11	149.91	2.23	0.12	
Read*Usage Type	1.58	688.71	435.45	6.59	0.00	0.03
Residual	370.10	24453.91	66.07			
Total	373.92					

Survey item 20, which asked if the respondents saw an improvement in student performance during the last 3 years, did not account for the variance in the dependent variable, TAKS reading passing rates. The variable was non-significant (see Table 29). However, the within-subjects contrasts tests were significant, as discussed in the introduction prior to Research Question 2. Only the within-subjects gains for reading were statistically significant: $F\ (1.60, 371.48) = 96.93$, $p < .001$, $\eta^2 = 0.293$.

Table 29

Repeated Measures ANOVA Summary Table for Effect of Usage Type and Survey Item 20 on TAKS Reading Percent Passing

	df	SS	MS	F	p	η^2
Between						
SI _20	1.00	16.51	16.51	0.22	0.64	
Usage Type	1.00	13.43	13.43	0.18	0.68	
Within	371.48					
Read	1.60	10211.31	6488.20	96.93	0.00	0.29
Read* SI _20	1.60	39.20	24.91	0.37	0.64	0.00
Read*Usage Type	1.60	777.20	493.81	7.40	0.00	0.03
Residual	368.28	24651.81	66.94			
Total	373.48					

Survey item 14 asked respondents if they met regularly with peers to collaborate on student performance results. The variable did not account for the variance in the dependent variable, TAKS math passing rates. Survey item 14 was non-significant (see Table 30). The within-subjects contrasts tests were significant, as discussed in the introduction prior to Research Question 2.

Table 30

Repeated Measures ANOVA Summary Table for Effect of Usage Type and Survey Item 14 on TAKS Math Percent Passing

	df	SS	MS	F	p	η^2
Between						
SI _14	1.00	178.04	178.04	1.99	0.16	
Usage Type	1.00	2114.29	2114.29	23.63	0.00	0.09
Within	400.4					
Math	1.70	12356.35	7283.06	113.05	0.00	0.33
Math * SI _14	1.70	110.19	64.95	1.01	0.36	
Math*Usage Type	1.70	1523.73	898.12	13.94	0.00	0.06
Residual	397.0	25575.98	64.42			
Total	402.4					

Survey item 16 asked respondents if they regularly implemented the strategies learned at the collaborative table. The variable did not account for the variance in the dependent variable TAKS math passing rate. Survey item 16 was non-significant (see Table 31). However, across time, the within-subjects gains in math were significant: $F(1.70, 401.56) = 100.21$, $p < .001$, $\eta^2 = 0.30$.

Table 31

Repeated Measures ANOVA Summary Table for Effect of Usage Type and Survey Item 16 on TAKS Math Percent Passing

	df	SS	MS	F	p	η^2
Between						
SI _16	1.00	129.28	129.28	1.44	0.23	
Usage Type	1.00	2068.03	2068.03	23.06	0.00	0.09
Within	401.56					
Math	1.70	10924.87	6420.61	100.21	0.00	0.30
Math * SI _16	1.70	176.40	103.67	1.62	0.20	
Math*Usage Type	1.70	1305.15	767.04	11.97	0.00	0.05
Residual	398.16	5509.78	64.07			
Total	403.56					

Teachers' perceptions of learning at the collaborative table for survey item 17 was significant and did not account for differences in TAKS math passing (see Table 32). Those with more positive perceptions of the effectiveness of the strategies learned at the collaborative table did not have statistically higher TAKS math passing rates. The within-subjects difference in math was significant: $F(1.70, 401.89) = 92.95$, $p <.001$, $\eta^2 = 0.28$.

Table 32

Repeated Measures ANOVA Summary Table for Effect of Usage Type and Survey Item 17 on TAKS Math Percent Passing

	df	SS	MS	F	p	η^2
Between						
SI _17	1.00	198.59	198.59	2.22	0.14	
Usage Type	1.00	2136.44	2136.44	23.90	0.00	
Within	401.89					
Math	1.70	10169.05	5971.47	92.95	0.00	0.28
Math * SI _17	1.70	85.64	50.29	0.78	0.44	
Math*Usage Type	1.70	1351.66	793.72	12.36	0.00	0.05
Residual						
Total	403.89					

Survey item 20, which asked if the respondents saw an improvement in student performance during the last 3 years, did not account for the variance in the dependent variable, TAKS math passing rates. The variable was non-significant (see Table 33). However, the within-subjects contrasts tests were significant, as discussed in the introduction prior to Research Question 2. Only the within-subjects for math gains were statistically significant: $F\ (1.70, 401.79) = 142.88$, $p < .001$, $\eta^2 = 0.38$.

Table 33

Repeated Measures ANOVA Summary Table for Effect of Usage Type and Survey Item 20 on TAKS Math Percent Passing

	df	SS	MS	F	p	η^2
Between						
SI _20	1.00	7.36	7.36	0.08	0.78	
Usage Type	1.00	1766.63	1766.63	19.58	0.00	0.08
Within	401.79					
Math	1.70	15610.74	9169.16	142.88	0.00	0.38
Math *SI_20	1.70	39.20	24.91	0.37	0.64	
Math*Usage Type	1.70	1360.55	799.14	12.45	0.00	0.05
Residual	398.39	25566.20	64.17			
Total	403.79					

Research Question 5: Does exposure to a model that uses data analysis to impact instruction result in a change in the usage of the district's online data web? The district being studied provided campuses with a data web where data reports were housed. Administrators and teacher leaders with passwords could look up and print data reports after each TAKS and benchmark assessment. The data in Table 34 show the percentage of increase in data web pages accessed by the campuses between 2004-2005 and 2005-2006.

Data web usage increased for all 12 campuses. The high implementation campuses showed gains from 13% to 87% (see Table 34). The campus that showed the lowest gain of the high implementers (High 1) had the top usage of the 12 campuses in 2004-2005 and had the second highest usage in 2005-2006, accounting for its low increase.

Table 34

Growth by Percentage for 2005 and 2006 Data Web Usage

	Usage		Percent Increase
	2005	2006	
High 1	875	1,002	13%
High 2	129	1,569	87%
High 3	293	676	57%
High 4	86	319	73%
High 5	27	92	71%
High 6	142	282	50%
Total	1,552	3,940	39%
Low 1	554	1,471	62%
Low 2	840	951	12%
Low 3	657	2,162	70%
Low 4	36	176	80%
Low 5	256	333	22%
Low 6	138	1,182	88%
Total	2,481	6,275	40%

The low implementation campuses had increases between 12% and 88%, similar to the high implementers (see Table 34). The campus with the 12% growth (Low 6) had the highest usage of the six low implementation campuses and dropped to fourth the following year.

The high implementation campuses had accessed 1,552 pages in the data web in 2004-2005, versus 3,940 pages in 2005-2006. This was a 39% increase from the year before. The low implementation campuses increased from 2481 in 2004-2005 to 6,275 pages in 2005-2006. This was a 40% increase.

Of the 230 respondents who answered survey item 5, 50% did not have an account that allowed them to access the data web (see Table 35). Of those that answered, 12% said they used the data web at the “Beginning of the Year and After Each Benchmark” and another 12% chose “Weekly.” Of the respondents, 10% said they used the web only after each benchmark was given.

Table 35

Frequency Descriptive of Survey Item 5

	#	%
No Account	118	50
Beginning of the Year Only	9	4
After Each Benchmark	24	10
Beginning of the Year and After Each Benchmark	29	12
Monthly	21	9
Weekly	29	12
No Response	7	3

Research Question 6: Is there a difference in DCM usage perception between campus administrators and teachers? A regression was used to measure difference in DCM usage perception between campus administrators and teachers using survey items 3, 6, 7, 8, 9, 13, 15, 16, 19, and 20. There was a significant difference between the administrators and teachers in 9 out of 10 questions. Teachers chose more tools or more strongly agreed that they implemented the DCM than administrators. Only survey item 19 (During early release days my campus effectively uses the DCM tools) was non-significant, showing no difference between administrators and teachers (see Table 36).

Table 36

Regression Model Showing the Difference in Perception Between Administrators and Teachers in DCM Usage Perception

	B	SE	β	f^2
DCM Impact (SI 3)	2.20	0.8	0.17*	0.03
DCM Know (SI 6)	2.88	0.47	0.36*	0.15
DCM Use (SI 7)	2.5	0.44	0.36*	0.14
To Help Plan (SI 8)	1.3	0.40	0.20*	0.04
To Help Guide (SI 9)	1.9	0.40	0.24*	0.06
Use Early Release Packet (SI 13)	3.0	0.39	0.45*	0.25
DCM Supported (SI 15)	1.3	0.41	0.21*	0.04
Implement Strategies (SI 16)	0.6	0.39	0.10	
DCM during Early Release Day (SI 19)	1.2	0.42	0.18*	0.03
Improvement in Student Performance (SI 20)	1.1	0.41	0.18*	0.03

Note. Variable SI = Survey Item. * = significant at .05 level.

The regression analysis showed there was a significant difference between teachers' and administrators' responses with survey item 3 (DCM has helped me understand how to impact instruction through: 11 strategies/tools listed). Teachers were more apt to choose 2.2 more strategies/tools than administrators (see Table 36). In survey item 6 (I understand how to use the following DCM tools: eight strategies/tools listed), teachers chose 2.8 more tools. In survey item 7 (I actually use the following DCM tools: eight strategies/tools listed), teachers chose 2.5 more tools than administrators.

The next seven survey items measured were Likert scale questions. In survey items 8, 15, 19, and 20, the teachers agreed one degree more strongly on the scale than administrators that they were doing those particular DCM processes. For survey item 16 (I regularly implement strategies I learn at the collaborative table), there was not a measurable difference between teachers and administrators when it came to implementing strategies.

For survey item 9 (I use 1 or more DCM tools to guide my decisions about what student interventions to implement), teachers selected this at approximately two degrees higher on the Likert scale than administrators. Survey item 13 (I use some or all of the Early Release Day packet) had the highest-level difference, with three degrees of difference between teachers and administrators. Teachers more strongly agreed that they used the Early Release Day packet.

Research Question 7: What impact does the principal have on the implementation of the DCM model? Survey items 6 and 7 were analyzed by using a cross tabulation to compare principals' understanding and usage of the DCM to teachers' understanding and usage of DCM tools and processes. A tabulation was run on each of the eight tools in survey items 6 and 7 (see Table 37).

In the both the "I understand how to use" and "I actually use" the DCM tools categories, principals selected Pre-slugged Templates (see Table 37) as their first choice of DCM tool to use (83%). Teachers' first choice was the Classroom Profile (52%), which was the second choice for principals. The next highest percentage for principals was 58% with two tools, the TAKS tools and the Vertical Alignment form. There was also a tie for second choice between the Pre-slugged Templates and the Guiding Questions (20%) for teachers.

In the “I do not understand how to use” and “I do not actually use” the DCM tools category, 50% of the principals and 95% of the teachers selected the Cycle of Inquiry (see Table 33). The next highest tool “not used and not understood” was a tie between the TAKS tools and the Learning Log (25%) for principals. Of the teachers who responded, 71% “did not understand or use” the Learning Log and 69% “did not understand or use the TAKS tools.”

Table 37

Comparing Principals' and Teachers' Understanding and Usage of DCM Tools and Processes

	Use, Understand				Not Use, Understand				Use, Not Understand				Not Use, Not Understand			
	Principals		Teachers		Principals		Teachers		Principals		Teachers		Principals		Teachers	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
TAKS Tools	7	58	37	17	2	16	18	8	0	0	11	5	3	25	148	69
Pre-slugged Templates	10	83	43	20	1	8	13	6	1	8	5	2	0	0	153	71
Vertical Alignment Form	7	58	45	21	2	16	28	13	1	8	6	3	2	16	135	63
Content Area Guiding Questions	5	42	42	20	4	33	30	14	1	8	10	5	2	16	132	62
Student Profile	5	42	38	18	4	33	24	11	1	8	17	8	2	16	135	63
Cycle of Inquiry	3	25	8	4	3	25	10	5	0	0	1	0	6	50	195	91
Classroom Profile	9	75	111	52	1	8	32	15	2	16	12	6	0	0	59	28
Learning Log	3	25	24	11	3	25	27	13	2	16	10	5	3	25	153	71

Summary and Chapter Overview

Chapter 4 presented the results obtained from the DCM survey responses that were returned from participants. When analyzing the data, survey questions were grouped for analysis in three ways. The first way was the selection of high and low implementation campuses. The second way was by factors created from subsets of survey questions. The third way was by research questions that were answered by factors and by survey questions. The chapter contained the results from the survey data that answered the questions posed by the way the survey questions were grouped. Various tables and figures displayed the statistical results of how the schools were selected, statistical results from the four factors, including the factor research sub-questions, and the answers to the seven research questions.

Chapter 5 will present a dialogue about the limitations of the study; the implications of the findings, which include interpretation of the data and inferences that may be drawn; implications as they relate to the literature; policy implications; and suggestions for further studies. The chapter will conclude with a summary of the study.

Chapter 5

FINDINGS AND CONCLUSIONS

This chapter will present a dialogue about the limitations of the study and the implications of the findings, which include interpretation of the data and inferences that may be drawn. It will also present the implications as they relate to the literature, policy implications, and suggestions for further studies. The chapter will conclude with a summary and findings of the study.

The purpose of this study was to examine the relationship between using the Data Collaborative Model (DCM), a process of instructional improvement using data analysis, and student achievement. The rationale was that campuses, which have attempted to create and implement a culture of data-driven decision making in a collaborative, reflective setting over a 3-year period of time, would see an increase in teacher effectiveness. This process should have a natural output of increased student performance.

This research study was a causal-comparative study, comparing student achievement over a 3-year period of time between campuses with a high level of DCM implementation and campuses with a low level of DCM implementation. The causal-comparative method "is aimed at the discovery of possible causes for the phenomena being studied by comparing subjects in whom a characteristic is present with similar subjects in whom it is absent or present to a lesser degree" (Borg & Gall, 1989, p. 331).

Summary of Research

Research to this point has been very clear that there are practices known to work in urban districts (Council of the Great City Schools, 2002). Well-known researchers are voicing more and more firmly that the secret to educational success is known (DuFour, 2004b; Schmoker, 2004b). Practices such as teacher collaboration, reflective practice, professional learning communities, and distributed leadership have been studied and found to be successful when implemented consistently (DuFour, 2004b; Fullan, 2001; Schmoker, 2004a, 2004b; Timperley, 2005).

School reform initiatives have been a constant in educational life since the National Commission on Excellence in Education published its report in 1983, *A Nation at Risk: The Imperative for Educational Reform*. A variety of reforms have been tried, some with limited success, which is dependent on the level of implementation (Fullan, 2001). The struggle to change high schools through initiatives such as smaller learning communities (SLCs) is often described in newspapers and educational journals because of the interest shown by known personalities such as Bill and Melinda Gates and Warren Buffett.

In Texas, the legal systemic plan for school reform involves these five components: (a) a standards-based curriculum known as the Texas Essential Knowledge and Skills (TEKS), (b) the state assessment called Texas Assessment of Knowledge and Skills (TAKS), (c) an evaluation instrument for principals and teachers (PDAS), (d) a public report card of campus and district performance called Academic Excellence Indicator System (AEIS), and (e) a state required committee for site-based decision making functioning at both the campus and the district level (Texas Association School

Boards, 2006). In this age of accountability, Texas seems to be leading the way, recognizing the importance of principals and teachers by holding them accountable through the state assessments and site-based decision making on each campus.

Because accountability has become such a strong measuring tool, with severe consequences for campuses that do not show improvement in student achievement, it has become even more important to focus on implementing effective practices that will lead to student growth. The researcher designed a study to measure the impact of the Data Collaborative Model on a large urban district through focusing on 12 elementary campuses selected because of their personnel's survey responses.

The age of accountability has focused attention on not only what is taught but also how it is taught (Jacob, 1997, 2004; Marzano, Pickering, & Pollock, 2001). Not only is there is a need for reliable assessments aligned to rigorous curriculum, but also there is a need to know how to use the information gleaned from the assessments (Stiggins, 2004). A process must be in place to help campuses understand how to read data and to turn the information into an action plan:

> When this process is absent, confusion reigns. Staff from schools indicated that they did not see the connection among teacher-administered in-class assessments, their norm-referenced district test, and the large-scale state assessment. Nor did they know what to do with this information. (Learning Point Associates, 2000, p. 1)

The need to bring a collaborative assessment culture to a campus is becoming more and more apparent (Bernhardt, 1999; DuFour & Eaker, 1998; Holcomb, 2004; Schmoker, 2004b; Stiggins, 2004). The DCM process asked campuses to use a collaborative culture as a way to encourage teachers to meet regularly and to discuss data and student work in a non-threatening manner. Encouraging professional dialogue, the sharing of strategies, literature studies, shared vision, and distributed leadership are components of a professional learning community. The significance of this study becomes evident when one takes into consideration the seriousness of the task to be done.

Implications of Findings

This part will be divided into three sections. The first section will communicate the implications of the survey questions that were grouped in four factors. The second section will talk about the implications of the data as shown through the research questions. The third section will explore the hypothesis based on the results presented.

Factors. The factors were formed by sorting the survey items into four themes: (a) Understand the DCM, (b) Implement the DCM, (c) Collaborate/ Reflect, and (d) Professional Development. After reliability statistics were run, the high implementation campuses had factor means that were consistently higher than the low implementation campuses in all factors except the Understand factor (see Tables 10 and Table 11). The Understand factor had the lowest means in all five respondent types (principal, assistant principal, instructional specialist, general education teacher, and Fine Arts teacher). At high implementation campuses, between 43% and 60% of respondents said they understood how to impact instruction through the use of the DCM tools and process. Between 20% and 51% of respondents at low implementation campuses understood. Campus personnel seemed to be using the tools, even when there was a lack of understanding about the process. Principals had the highest means in every factor except Professional Development, where the assistant principal mean was 2.3% higher than the principal mean (see Table 10). The difference between principal and general education teacher means was significant for the Understand (diff = 7.7) and Implement factors (diff = 11.2), less so in the Collaborative/Reflective (diff = 4.4) and Professional Development (diff = 2.4) factors. This leads the researcher to believe that the principals either have not been consistent in their implementation of the DCM or have exaggerated their understanding of the DCM for purposes of the survey. There was an even greater difference in means between the principal and the Fine Arts teachers, which indicates that teachers not teaching the core content areas stand less chance of receiving best practice information.

In analyzing DCM survey items 3, 6, and 7; which asked respondents to select which DCM tools and strategies they (a) felt had impacted instruction on their campus, (b) understood how to use, and (c) actually used; there was not a significant difference between the high and low implementation campuses in two out of the four factors. For high implementation campuses, 43%-60% felt like the DCM tools impacted their instruction. The low implementation campuses had between 20% and 51% responding positively (see Table 10). There were slightly larger differences in the “I know and understand how to use the following tools” (survey item 6), with high implementation campuses having a range of 28%-49% of respondents indicating understanding. For the “I actually use the following tools” (survey item 7), 22%-41% of respondents at high implementation campuses and 10%-26% respondents at the low implementation campuses indicated usage. Although this lack of significance is reflected throughout the results, at the same time, it does begin to indicate that the campuses are beginning to understand and use the tools, rather than not using them at all.

Hypothesis. The researcher hypothesized that there would be a statistically significant difference in TAKS passing rates after using the Data Collaborative Model for a 3-year period of time. This was found to be true in TAKS math passing rates, but not in TAKS reading passing rates. By the fourth year, 2006, the high implementing group had a mean percent gain in reading of 3.66%. The gain in TAKS math was 5.79%. High implementing campuses also had higher means than low implementation campuses on their perception of DCM's impact on achievement (survey item 3), understanding the DCM tools (survey item), and actually using DCM tools (survey item 7) (see Table 4).

Research questions. Research Question 1: What was the relationship for teachers between the self-reported (based on the survey results) understanding and uses of common and continuous assessment? Table 16 reported the percent of respondents that "Do Not Use, Do Not Understand" compared to "Use and Understood" by tool and strategy type. The larger majority, with ranges of 25.7% to 89.5% of the respondents at each campus, indicated that they "Do Not Use, Do Not Understand" the DCM tools. This was compared to the "Use and Understand" category with campus percentages ranging from 4.6% to 53%. In some cases, up to three times as many people were apt not to understand or use a DCM tool or strategy even after 3 years of the DCM being a district initiative. This becomes more understandable when one looks at the regularity in principal turnover, change of placement in sub-areas done almost yearly, and lack of consistent monitoring on the part of the district leadership. Michael Fullan was very clear when he said, "general support or endorsement of a new program by itself has very little influence on change in practice (e.g. verbal support without implementation follow-through)" (Fullan, 2001, p. 81).

Research Question 2: What impact does regularly scheduled teacher reflection on data have on student achievement? When TAKS reading passing rates were analyzed using one-way repeated measures ANOVA with survey item 20 and Collaborate (a survey factor) as covariates, there were no significant between-subject effects (see Table 20). When TAKS math passing rates were analyzed in a similar manner with survey item 20 and Collaborate as covariates, the only significant between-subject effect was for Usage Type.

Although teachers are beginning to use some of the DCM tools, implementation on the campuses is irregular or inconsistent, so significance cannot be attributed necessarily to the DCM. It is important to note that there was a significant difference in math, which needs to be studied further. Because the district had a math learning communities initiative beginning in 2001, there may have been some impact on the math data from that. It would need to be studied to verify if this was the case.

The combined TAKS passing rates and mean gains by high implementation and low implementation groups were reviewed. The data showed that the high implementation campuses had higher gains between 2003-2006, overall.

Research Question 3: What is the relationship between job-embedded professional development and student achievement? When TAKS reading passing rates were analyzed using one-way repeated measures ANOVA with Professional Development as a covariate, there were no significant between-subject effects (see Table 22). The only significant within-subject effect was for Usage Type.

When TAKS math passing rates were analyzed, between-subject effects for Usage Type were significant (see Table 19). The only significant within-subject effect was also for Usage Type. The significance of the within-subject effect may be attributed to the inconsistent implementation of the DCM process at campuses. This is reinforced by the research done by Joellen Killion (2002). The study on the effectiveness of staff development on student achievement mentions that, although sometimes one sees student achievement increase after teachers have received staff development, one cannot make an immediate assumption that the direct cause of the increase was the staff development:

> Staff development is much like the respiratory system in the body. As one of the body systems, it is essential to the body's basic operation. But, to be fully functioning and healthy, the body needs all its systems working together. Removal or dysfunction of any system leaves the body in poor health and at risk. The same is true for school improvement efforts focused on increasing student achievement. To be successful, school improvement requires multiple systems, working together to achieve success. These systems include staff development, compensation, teacher evaluation, student assessment, and many others. Eliminating any one system increases the risk that school improvement efforts will be unsuccessful.
>
> In addition, simply knowing that teachers participated in staff development and that student achievement increased does not prove that staff development was responsible for the increase. Multiple factors such as higher standards, improved curriculum frameworks, and new types of assessment are also associated with increased student learning and cannot be measured in isolation. (Killion, 2002, p. 22)

In the case of the statistical significance found in the between and within test in TAKS math Usage Type, one would have to do further study to see what other factors were possibly impacting the teacher effectiveness at those campuses.

The difference in significance between reading and math needs to be studied further. One possible answer could be attributed to the math learning communities pilot that began in 1998 on a few campuses and has since spread to many campuses in the district. If the significance can be traced to that initiative, then it would give credence to the research that says that most new initiatives take several years to become sustained in the educational environment of the campus of district. As Speck (1996) concluded from his research:

> Professional development takes time and must be conducted over several years for significant change in educational practices to take place. Substantial change in school practice typically takes four to seven years, and in some cases longer. (p. 35)

District administrators must take into account this long time frame. Teachers need to be prepared and equipped to engage in professional development throughout their careers.

Research Question 4: What impact does the use of the DCM have on student achievement over a period of 3 years? The data in Table 20 show the increase in the percentage of students passing the state assessment (TAKS) in reading beginning the second year after TAKS was introduced. The high implementation campuses had between a 29% and 71% increase in percent passing. The low implementation campuses had between a 6% loss to a 79% increase in percent passing. The average percent gain for the high implementation campuses in reading was 38%, versus 47% for the low implementation campuses.

Increases in student performance on the state assessment (TAKS) in math also began the second year after TAKS was introduced (see Table 20). The high implementation campuses had between a 30% and 66% increase. The low implementation campuses had between a 4% and 79% increase. The average percent gain for the high implementation campuses in math was 53%, versus 69% for the low implementation campuses.

Although all campuses were exposed in some varying degrees to the DCM and all campuses showed gains on the percent of students passing the TAKS, items measuring the level of implementation of DCM (survey items 14, 16, 17, and 20) were not shown through statistical tests to impact TAKS gains. Separate one-way repeated measures ANOVA analyses by implementation level were performed on TAKS percent passing with each survey question as a covariate (see Tables 23 through 30). Statistical tests found the difference in math gains were significantly higher for the high implementation group than the low; however, gains were not mediated by the concepts measured in survey items 14, 16, 17, and 20.

Research Question 5: Does exposure to a model that uses data analysis to impact instruction result in a change in the usage of the district’s online data web? The district being studied provided campuses with a data web housing data reports. Administrators and teacher leaders with passwords could access and print data reports after each TAKS and benchmark assessment. Each time a data report was accessed by someone with a password, it counted as one “page.” Beginning fall 2004, records were kept of campus usage of the data web by the amount of data “pages” accessed online.

Data web usage increased for all 12 campuses. The high implementation campuses showed gains from 13% to 87% (see Table 30) in pages accessed. The high implementation campus that showed the lowest gain (High 1) had the top usage of the 12 campuses in 2004-2005 (875 pages) and had the second highest usage in 2005-2006 (1,002 pages), accounting for its low increase. The low implementation campuses had increases between 12% and 88%, similar to the high implementers. The campus with the greatest increase was a low implementing campus. It increased in usage from 138 pages in 2004 to 1,182 pages in 2006.

The high implementation campuses had accessed a total of 1,552 pages on the data web in 2004-2005, versus 3,940 pages in 2005-2006. This was a 39% increase from the year before. The low implementation campuses increased from 2,481 pages in 2004-2005 to 6,275 pages in 2005-2006. This was a 40% increase. Some of the growth percentage in the low implementation campuses may be attributed to the fact that overall there were more large campuses in the low implementation group than the high group.

During the 2004 school year, only campus administrators were allowed to access the data on the web. In 2005, the district allowed teacher leaders to have access so they could aid in downloading reports for the rest of the campus teachers. This helped explain the dramatic increases seen at some campuses.

Despite the increase in usage of the data web, when respondents were asked how often they accessed the data web, only 12% said they did so weekly, another 12% said at the beginning of the year and after each benchmark, and 10% said after each benchmark (see Table 35). Only 9% checked the data web monthly, and 4% said they checked the data web only at the beginning of the year. The other 50% did not have a password to log on to the site. District personnel, both teachers with passwords and administrators, are still not in the habit of relying on regular use of the data web to aid them in impacting student achievement through data analysis.

Research Question 6: Is there a difference in DCM usage perception between campus administrators and teachers? Out of 10 questions, nine showed a significant difference in DCM usage perception between the administrators and teachers. Teachers chose more tools or more strongly agreed they implemented the DCM. Only on survey item 19 (During early release days my campus effectively uses the DCM tools) did the data show there was no significance between administrators and teachers (see Table 36). One can conclude that the surveyed campuses are implementing the DCM at the teacher level based on teacher responses. In 9 out of 10 questions the principals' responses did not correspond with what the teachers said about implementation of the DCM process and tools on their campuses. One could conclude that the principals are not taking an active role in the implementation process of the DCM with their teachers.

The regression analysis found a significant difference between teachers and administrators on survey item 3 (DCM has helped me understand how to impact instruction through: 11 strategies/tools listed). Teachers were more apt to choose 2.2 more strategies/tools than administrators (see Table 36). In survey items 6 (I understand how to use the following DCM tools) and 7 (I actually use the following DCM tools), teachers chose 2.8 and 2.5 more tools, respectively, than administrators. One can conclude that, although the teachers are understanding and using the DCM tools as they analyze data, their principals do not necessarily join them. At meetings where DCM tools are used, principals may not have the deeper understanding that comes from actual use and practice of the process.

The next seven survey items were Likert scale format. On survey items 8, 15, 19, and 20, teachers' mean scores were slightly higher than administrators regarding using certain DCM processes. Although the mean score on survey item 16 was higher for teachers, there was not a significant measurable difference between teachers and administrators regarding implementing strategies. Teachers do not seem ready for the next step of the DCM process, which is to implement the strategies learned at the collaborative table.

For survey item 9 (I use 1 or more DCM tools to guide my decisions about what student interventions to implement), the teachers' mean score was much higher than administrators. Survey item 13 (I use some or all of the Early Release Day packet) had the greatest difference, where teachers were three times more likely to use the Early Release Day Packet than principals (see Table 32). This could be a delegated activity, to hand off to teachers the materials to prepare the campus for an early release day, which may explain why principals do not use the packet like teachers say they do.

Although principals were more apt to say they understood and implemented the DCM (see Table 7), teachers reported using tools and strategies at a higher rate. This could be attributed to principals encouraging teachers to take part in the DCM process, but not actually doing the components themselves.

Research Question 7: What impact does the principal have on the implementation of the DCM model? For both "I understand how to use" and "I actually use," principals chose Pre-slugged Templates (83%) as their first choice of DCM tool to use (see Table 18). Teachers' first choice was the Classroom Profile (52%), which was the second choice for principals. The next highest percentage for principals was 58% with two tools, the TAKS tools and the Vertical Alignment form. There was a tie for second choice for teachers between the Pre-slugged Templates and the Guiding Questions (20%).

In the "I do not understand how to use" and "I do not actually use" category (see Table 33), 50% of the principals and 95% of the teachers chose the Cycle of Inquiry. The next highest tool not used and not understood was a tie for the principals between the TAKS tools and the Learning Log at 25%. Teachers did not understand or use the Learning Log (71%), and 69% did not understand or use the TAKS tools, although only 25% of the principals claimed to not use or understand the same tools.

There seems to be a dichotomy when it comes to DCM tool usage on the campus. Of the principals, 83% claimed they understood and used the Pre-slugged Template, but only 20% of teachers said they use the same tool. Among the principals who responded, 75% said they understood and used the Classroom Profile, but only 52% of teachers did the same. Of the principals who responded, 58% said they used and understood the TAKS tools, but only 17% of teachers responded similarly. This may be a reflection of either principals' thinking the tools are being understood and used on their campus or an exaggeration for purpose of the survey.

Concluding Discussion

The large urban district in this study has 217 schools, 160,000 students, and 20,000 employees. Change comes slowly to any organization (Marzano, Zaffron, Robins, Zraik, & Yoon, 1995), but it is especially hard in large bureaucracies. The 12 schools studied reflected the urban trend seen by many large districts (Council of the Great City Schools, 2004):

- Initiatives not monitored to full implementation–not monitored and not supported with the resources needed to effect the desired change;
- High principal turnover–7 of the 12 campuses studied had between two to three leadership changes within the 3 years of this study;
- Changes in sub-areas and/or feeder patterns–6 of the 12 campuses changed sub-area and or feeder patterns, which usually meant a change in focus as per the superintendent of that sub-area. In half of those cases the sub-area changes occurred along with principal changes;
- General superintendent turnover–the district had two superintendents and an interim superintendent during the 3 years of the study. New top leadership impacted initiatives and performance targets; and
- Small gains in student achievement– gains could not be attributed to any one cause of practice, due to a lack of consistent implementation in any sub-area or campus.

During the 3-year study, the district in this study did not have a rigorous and relevant curriculum in place long enough to make a difference in scores, nor did it have stable leadership, efficient management and strong parental and community support. The district had “pockets of excellence” due to sincere campus leaders doing all they could to implement effective instructional practices on their campuses. But “stimulating, coordinating, and sustaining ‘coherent’ development across many schools is exceedingly difficult because it requires balancing top-down and bottom-up forces” (Fullan, 2001, p.

170). This district had not learned how to manage those forces with wide success during the 3-year study.

There is research pointing to effective practices that work with urban schools. Progress is being made toward the performance benchmarks that states have established (Council of the Great City Schools, 2004) and it is happening for several different reasons. A report written by Council of the Great City Schools (2004) stated that the progress can be attributed to, “higher standards; strong and stable leadership; better teaching; more instructional time; regular assessments; stronger accountability; parental and community support; and efficient management” (p. 65).

The research gives hope to urban districts. There are practices that can make a difference district-wide, but the implementation process must be well planned and systemic. The Data Collaborative Model was a well–intentioned initiative based on research and effective practices. It was begun in the spring of 2003 with a benchmark template that was created to aid teachers in the disaggregation of their data. By the following year, the district leadership created an executive director position to help reinforce the initiative. That person was to train 217 campus principals at the beginning of the school year and was to create data analysis tools that would aid campuses in understanding and using the data being made available to them in the form of TAKS and benchmark assessment reports. Although the interim superintendent included the DCM in his initiatives list at the beginning of the 2005-2006 school year, little effort was made to monitor its implementation through the sub-areas. As Fullan wrote in 2001, “support of central administrators is critical for change in district practice. …general support or endorsement of a new program by itself has very little influence on change in practice (e.g., verbal support without implementation follow through)" (Fullan, 2001, p. 81).

Examples of lack of unity and support for the DCM initiative included, (a) little support and monitoring of implementation at the sub-area level by some of the area superintendents; (b) requests for the DCM director to be placed on the sub-area principal meeting agendas were often declined or, if accepted, was limited in time; and (c) although the district had its own data web, sub-areas often paid large amounts of money to outside vendors to bring similar data webs to their campus with no follow-up data analysis training. In essence, each sub-area operated as its own domain, with very little interference from district leadership. Another example included denying the DCM director's request to build training capacity in instructional coaches and specialists in a systemic manner, so that more than one person could be available to train the campuses in DCM practices after the TAKS and benchmarks had been given.

For the district to see change in schools, it must begin with "reculturing towards interactive, accountable, inclusive professional learning communities" (Fullan, 2001, p. 180). Elmore (2005) also agreed that what is necessary is a change in the organization itself, in its very culture. Elmore wrote, "Improvement at scale is largely a property of organizations, not of the pre-existing traits of the individual who work in them. Organizations that improve do so because they create and nurture agreement on what is worth achieving" (p. 25). Organizations must put in place the internal processes by which to help people gradually learn how to implement the change in order to achieve the desired goal.

Recommendations

For this district to move toward sustainable change that will ultimately result in a positive difference in student achievement, it must “reculture” (Fullan, 2001, p. 180) itself into an effective learning organization that has the internal commitment from its stakeholders to use its “context-specific expertise” (p. 270) to work together to figure out what is needed to put in place the needed internal processes mentioned by Elmore (2005). Professional learning communities have been the practice that researchers are lauding and at the same time lamenting their lack of use (Dufour, 2004b; DuFour & Eaker, 1998; Schmoker, 2004b). More than one researcher has written forcefully about this research-based best practice that has been shown through studies to successfully impact student achievement through a change in teacher practice. Schmoker (2004b) spoke for many when he wrote,

> But here's the problem. Such "learning communities" -- rightly defined -- are still extremely rare. For years, they have been supplanted and obscured by hugely popular, but patently discredited, reform and improvement models. The record is clear that these failed, unnecessarily complex reforms have had only the most negligible impact on what should be our core concern: the quality of teaching students receive.
>
> As Jim Collins has famously found, any organization attempting improvement must first "confront the brutal facts" about itself. In our case, the facts point to a fairly stark choice and an unprecedented opportunity for better schools. The place to begin is with a hard look at the evidence against

> conventional reform and improvement efforts -- and at the evidence that argues for the right kind of "learning communities." (p. 424)

Policy implications. Among the best practices lauded by researchers such as DuFour (2004b) and DuFour, DuFour, Eaker, and Karhanek (2004), DuFour and Eaker (1998), Fullan (2005), Schmoker (2004a, 2004b), and many others is the professional learning community where a collaborative culture is set up on a campus. One of the key strengths of the professional teaching and learning cycle is its design as a job-embedded professional learning process that is ongoing and results driven. According to multiple correlation studies on teacher quality (Darling-Hammond, 2000; Darling-Hammond, Hightower, Husbands, LaFors, Young, & Christopher, 2003), higher levels of student achievement are associated with educators who participate in sustained professional development grounded in content-specific pedagogy. Continuous professional learning that increases teacher outcomes, in turn, impacts student outcomes. Unfortunately, the language in the Texas law that regulates the planning period given to teachers during the school day works against the best practice that research says can make a difference in teacher effectiveness. The policy stated that:

> …each classroom teacher is entitled to at least 450 minutes within each two-week period for instructional preparation including parent-teacher conferences, evaluating students' homework, and planning. A planning and preparation period may not be less than 45 minutes within the instructional day. During that time, a teacher may not be required to participate in any other activity. Education Code 21.40. (Texas Association School Boards, 2006, Policy On Line, ¶ 1)

The last line of the policy: "…a teacher may not be required to participate in any other activity" (Texas Association School Boards, 2006, Policy Online, ¶ 1) gives many teachers a policy-driven reason not to participate in learning meetings. The language of the law is archaic and needs to be updated to reflect the need for teachers to sit down regularly together to plan enriched lessons and to keep rigor high in teacher-made materials, tests, and student work.

Suggestions for future research. If the Data Collaborative Model continues to be implemented in this district, a similar study of high and low implementation campuses should be done after the 6th year of implementation. By then, especially if the Central Office leadership actively supports the implementation of the DCM, the difference between the high and low campus achievement gains should become more apparent.

The reason for the difference in statistical significance between the TAKS reading and math passing rates needs to be investigated as well. If indeed it turns out that the math learning communities initiative, started in 1998, has had such a positive impact, then furthering the initiative to include the other content areas should be considered. Another way to investigate the significant difference between reading and math would be to look at the average scale score by campus in those two content areas. Scale scores are more sensitive to smaller changes in scores. Whereas the TAKS passing rates have a two-point scale (i.e., pass or fail), the scale scores can discriminate between smaller changes due to having many more points on the scale. Looking at the 12 campuses in this study by average scale scores might show a change not reflected by passing rates.

Another area of study that would be valuable is to discern why teachers seem to be reluctant to try new strategies that are learned during professional learning communities meetings. This is especially given the fact that the strategies they would be implementing are from teachers who are getting higher scores in student achievement.

Legislators have tended to think of accountability as something new since NCLB, but schools have always had some sort of accountability, depending on the policies of their district that guides them. What has not changed much within the age of school reform is that not much change has actually managed to be sustained. Schools have attempted to bring in such practices as professional learning communities, but until we begin moving from a culture on which the work of the organization is the sum of the work of its individuals to a culture in which individuals' work is shaped by collective expectations, values, and commitments requires the exercise of agency at both the individual and collective level (Elmore, 2005). Elmore went on to say that the current working model of accountability is flawed. Accountability needs to be the organizational response to the needed change, not just action toward compliance or implementation.

When the district in this study has not only confronted the brutal facts, put in a coordinated, well-communicated organizational response to the problems that need to be solved, when all district shareholders understand the vision and feel the responsibility to work toward shared commitment, then the results will come. Only when teachers feel a responsibility not only to their students, but to each other, and show it through sharing successful instructional strategies, will campuses get stronger. When principals feel responsible not only to their teachers, but to other district principals as well to share their strategies with others, will they begin to feel like they are working in the same direction. When the Central Office can channel this momentum in a positive way, so that the whole school community, including parents and business partners, feels responsibility to helping the district be successful, then schools will begin feeling the positive impact change can bring.

Contained within the process of the Data Collaborative Model are research-based best practices that have made other urban schools around the country successful. The district in this study should take a second look at the implementation process to see if additional resources, time, and attention would benefit its campuses. With the right environment, as mentioned above, a process like the Data Collaborative Model could flourish and ultimately help students and teachers become stronger learners.

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Appendix A

Data Collaborative Model Survey

Data Collaborative Model
SURVEY

1. Org #________

2. I am a:
□ Principal □ Dean □ Assistant Principal
□ ESL pull-out, Special Education, or demonstration teacher
□ Instructional Specialist or Coach on a campus
□ Classroom Core Teacher (includes ESL/Bilingual teachers)
□ Fine Arts Teacher □ TAP

3. Select all that apply:
The DCM has helped me understand how to impact instruction through:
□ Analyzing TAKS data reports
□ Analyzing Benchmark reports with the pre-slugged templates and item analysis reports
□ Meeting regularly with colleagues to professionally dialogue
□ Sharing data results with colleagues
□ Sharing instructional strategies with colleagues
□ Sharing ideas and resources with colleagues
□ Reviewing student work for rigor and relevancy
□ Reviewing teacher-made tests for rigor and relevancy
□ Creating an action plan for my students based on the data
□ Taking part in job-embedded professional development opportunities such as sharing strategies, observing other teachers, and book/article studies
□ Using other DCM tools such as the Vertical Alignment Form and Classroom Profile Benchmark Assessment Form

4. I understand the need for common and continuous assessments.
Strongly Disagree 1 2 3 4 5 6 Strongly Agree

TOOLS

5. How often do you access data on the OIR Data Web?
□ Weekly □ Monthly
□ At the beginning of the school year only
□ At the beginning of the school year and after each Benchmark
□ After each Benchmark only □ I do not have an account

6. I understand how to use the following DCM tools:
□ The beginning-of-the-year DCM TAKS reflection tools
□ The pre-slugged templates that arrive online after each Benchmark
□ The Vertical Alignment Form
□ The Content Area Guiding Questions found in the Teacher Packet for Early Release Day
□ The Student Profile document that allows a student to take part in assessment feedback and goal setting
□ The Cycle of Inquiry
□ Classroom Profile Benchmark Assessment Form
□ Learning Log that is used to record the ideas and strategies shared during the meeting

7. I actually use the following DCM tools:
□ The beginning-of-the-year DCM TAKS reflection tools
□ The pre-slugged templates that arrive after each Benchmark
□ The Vertical Alignment Form
□ The Content Area Guiding Questions found in the Teacher Packet for Early Release Day
□ The Student Profile document that allows a student to take part in assessment feedback and goal setting
□ The Cycle of Inquiry
□ Classroom Profile Benchmark Assessment Form
□ Learning Log that is used to record the ideas and strategies shared during the meeting

8. I use one or more DCM tools to help me plan for my professional development.
Strongly Disagree 1 2 3 4 5 6 Strongly Agree

9. I use one or more DCM tool to guide my decisions about what student interventions to implement.
Strongly Disagree 1 2 3 4 5 6 Strongly Agree

10. Benchmark results are available online in a timely manner.
Strongly Disagree 1 2 3 4 5 6 Strongly Agree

11. I know how to access the DCM tools online on the OIR Data Web.
Strongly Disagree 1 2 3 4 5 6 Strongly Agree

12. I know how to access the Early Release Day Principal and Teacher Packet online on the OIR Data Web.
Strongly Disagree 1 2 3 4 5 6 Strongly Agree

13. I use some or all of the Early Release Day Principal and Teacher Packet available online on the OIR Data Web.
Strongly Disagree 1 2 3 4 5 6 Strongly Agree

IMPLEMENTATION

14. I meet regularly with my peers to collaborate on student performance results.
Strongly Disagree 1 2 3 4 5 6 Strongly Agree

15. The implementation of the DCM is supported in my school.
Strongly Disagree 1 2 3 4 5 6 Strongly Agree

16. I regularly implement strategies I learn at the collaborative table.
Strongly Disagree 1 2 3 4 5 6 Strongly Agree

17. The strategies I learn at the collaborative table are effective.
Strongly Disagree 1 2 3 4 5 6 Strongly Agree

18. I feel adequately trained to implement the DCM.
Strongly Disagree 1 2 3 4 5 6 Strongly Agree

19. During early release days my campus effectively uses the DCM tools.
Strongly Disagree 1 2 3 4 5 6 Strongly Agree

20. Answer this question only if your campus uses the DCM:
Since we began using the DCM, I have seen an improvement in student performance.
Strongly Disagree 1 2 3 4 5 6 Strongly Agree

21. I feel that I need more training on the OIR Data Web.
Strongly Disagree 1 2 3 4 5 6 Strongly Agree

22. I know whom to contact if I have questions about the DCM.
Strongly Disagree 1 2 3 4 5 6 Strongly Agree

Appendix B

Deputy Superintendent E-mail to Administration for DCM Survey Support

E-mail from the deputy superintendent of Curriculum and Instruction to the sub-area superintendents and the deputy superintendent of school support asking permission to send the DCM survey to the campuses.

>>> [redacted] 5/1/2006 3:32:05 PM >>>

[redacted] and [redacted],

Evaluation and Accountability and DCM would like feedback on the use of the online data and tools available to principals. Below is an e-mail and a web link to a proposed survey. Can OIR and DCM have your permission to send this voluntary survey to principals for improvement feedback?

They'd like to solicit improvement input prior to summer staff development.
Thanks,
[redacted]

Regards,
[redacted]
Deputy Superintendent
Instructional Services
[redacted]

>>>>>>

Appendix C

E-mail Communication to Principals Soliciting Research Participation

Copy of e-mail sent to principals and deans of the five participating sub-areas by the researcher asking for their participation in the survey.

>>> Becky Good >>>

Your Area Superintendent has given us permission to send your campus the link to the OIR/DCM Survey. We will be able meet your data and data analysis needs to more accurately through this survey instrument. It should take no longer than 5-7 minutes to fill out.

Please forward this e-mail, which contains the link to the Survey site to all your teachers. If e-mail is a problem, please ask your teachers and building administrators to access the DCM Survey link on the OIR Data Web page in the What's New box.

Just click on this link of click on the link on the OIR page to get to the survey.

http://[redacted]/DCM_Survey/

Thanks so much for your valuable input!
Rebecca Good
Executive Director,
Data Collaborative Model
Instructional Services
[redacted]

>>>>>>

Appendix D

Sample E-mail Reminder Communication

Copy of third e-mail reminder to principals about the DCM survey.

>>> Becky Good 5/22/2006 11:01:23 AM >>>
As we wind down the year, it is important to get your input on the OIR/DCM tools and processes to better meet your data analysis needs next year.
Please remind your teachers and building administrators, as an end of year action, to take 5 minutes to fill out the short survey.

Thank you to those whom have already responded!

Just click on this link or on the link on the OIR page to get to the survey.

http://[redacted]/DCMSurvey/

Thanks so much for your valuable input!
Rebecca Good
Executive Director,
Data Collaborative Model
Instructional Services
[redacted]

>>>>>>

Appendix E

Letter to Potential Participant

Rebecca B. Good
1724 Allende Ct.
214-680-8869
rb-good@comcast.net
March 28, 2006
Attention: Principal
Name of School Goes Here
Dallas, Texas 75204
Letter to Potential Participant

You are requested to participate in a research study on the Data Collaborative Model. It is important that everyone who uses the Data Collaborative Model process and the tools have an opportunity to give feedback on the effectiveness of their use. By filling this out you will help us grow as a district in this instructionally important area.

In addition to needing this information for district use, Rebecca Good, Executive Director of the Data Collaborative Model, will be using this information to write a dissertation on the DCM. This important study has implications in all big districts and she thanks you for the information that you will be allowing her to use in her doctoral study. This study has the approval of the Institutional Review Board at Texas A&M University-Commerce. Neither your name nor the name of your school will be used in any reports or publications of this study. Should you have questions about this study, contact either Tracy Henley (Chair of the Institutional Review Board,Tracy_Henley@tamu-commerce.edu), Natalie Henderson, Graduate Office (Natalie_Henderson@tamu-commerce.edu) via phone at 903-886-5200 or Rebecca Good (researcher) at 214-680-8869. Once again, your participation in this study is entirely voluntary. And you may withdraw at anytime without penalty.

The survey will be placed online on the OIR Website. An e-mail will be sent out to the campuses to inform everyone when it is online. The survey should take no longer than10 minutes to complete. Your time in answering the survey questions is appreciated.

Since the survey is online you will not be asked to sign a participants' agreement form. By logging in and answering the questions this researcher understands that you have agreed to take part. The survey will come back in an anonymous form. No one will know your responses.

Sincerely,

Rebecca B. Good

Appendix F

Deputy Superintendent E-mail to Researcher Granting Research Permission

E-mail from the deputy superintendent of Curriculum and Instruction to the researcher giving permission to send the DCM survey to the campuses.

>>> [redacted] 5/1/2006 4:49:59 PM >>>

Permission from [redacted] for survey.
I'll send the rest as they come in. When all are received, feel free to send out.
[redacted]

Regards,
[redacted]
Deputy Superintendent
Instructional Services
[redacted]

>>>>>>

VITA

Rebecca B. Good was born in Oceanside, California, on January 18, 1958, the daughter of Richard and Mimi Backus. After graduating from Hillcrest High School in 1975 in Dallas, she enrolled at the University of Texas at Austin. She completed 2 years there before finishing her Bachelor of Arts in Spanish from Southern Methodist University in 1978. In September 1979, she married Thomas Good, of Plano, Texas. Between 1981 and 1983, she had Nicholas Ryan and Austin Thomas. In 1986, she joined the Alternative Certification Program (Phase 1) with Dallas ISD as a bilingual teacher. She taught a combined 4 years at Peabody Elementary and Marcus Elementary. She and her husband adopted Jessica Ann in 1988 to complete the family. In 1990, she joined Plano ISD and worked as a bilingual teacher at Barron Elementary and an ESL Team Leader at Armstrong Middle School. She returned to Dallas ISD as a Dean of Instruction at Kennedy Learning Center in 1999. In 2001, she became principal at Cesar Chavez Leaning Center, which then achieved Recognized status in 2004. She then accepted the position of Executive Director of the Data Collaborative Model where she trained administrators and teachers in the best practices of reflective data analysis. About that time she was accepted in the Doctoral Program at Texas A&M University in the Department of Educational Administration. In December of 2006, she was awarded the Doctor of Education degree with a major in Educational Administration.

Permanent Address: 1724 Allende Ct.
Plano, Texas 75074