Teacher Implementation of Mathematics Curriculum Initiatives

in a Test-Driven Accountability Environment:

An Ethnographic Investigation into Leadership; School Culture;

and Teacher's Attitudes, Beliefs, and Concerns

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Robert M. McGee III

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DEDICATION

Though many people have contributed to the completion of this pursuit, only one was indispensable.

This dissertation is dedicated to Anne, my wife, partner, and best friend. Her love, friendship, support, and candor [and I mean candor], has made me the person I am today. She has taught me how to live, to love, and to laugh. She has helped me see what is truly important in life.

During this four-year journey, she has been at my side providing support and making sacrifices. It began with “You’re going to do WHAT?” and ended with a continuous stream of “You’re going to do it, now get to work!”

Anne, this accomplishment is as much yours as mine. I love you.

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ABSTRACT

Teacher Implementation of Mathematics Curriculum Initiatives in a Test-Driven Accountability Environment: An Ethnographic Investigation into Leadership; School Culture; and Teacher's Attitudes, Beliefs, and Concerns

Robert M. McGee III
Sheila R. Vaidya, Ph.D.

This ethnographic study investigated the implementation process of mathematics curriculum initiatives designed to improve student achievement in a test-driven accountability environment. The research focused on complex factors within the school contextual environment influencing implementation and student achievement specifically, leadership; school culture; and teacher's attitudes, beliefs, and concerns.

The mixed methodology included statistical analysis of changes in state assessment scores of eighth grade students over a two-year period in four middle schools. The larger qualitative component involved the researcher, as participant observer, collecting data on implementation levels, leadership characteristics, elements of school culture, and individual teacher's attitudes, beliefs and concerns. Informal interviews and observations of 26 mathematics teachers and school leaders were conducted over a period of 12 weeks. In addition, teacher *Concerns Profiles* were developed from the Stages of Concern Questionnaire (Hall & Hord, 2001). The resulting profiles of school culture, leadership elements, and teacher's attitudes, beliefs, and concerns were analyzed for patterns and themes related to implementation levels and changes in state assessment scores.

Findings indicated a relationship between: (1) the level of implementation of the curriculum initiative and improvements in state assessment scores and (2) a teacher's *Stage of Concern* and their level of implementation. Additionally, the study identified potential influences on teacher's attitudes, beliefs, and concerns including (1) the *Form* of instructional team/grade level subculture; (2) the support of team/grade level leaders; (3) the depth to which overall school leadership supports the curriculum initiatives; and (4) the availability of time to implement the initiatives.

The conclusions confirm existing research on the influences of individual teacher's attitudes, beliefs, and concerns on their classroom practice while underscoring the importance of distributed leadership and collaborative instructional cultures in schools if improvement initiatives are to have the intended impact on student achievement. The study adds clarity to the complex set of factors within a school that can facilitate or impede successful implementation of curriculum initiatives designed to improve the achievement of all students.

CHAPTER ONE: INTRODUCTION

Background and Societal Context

On January 8, 2002, President George W. Bush signed into law the reauthorization of the Elementary and Secondary Education Act of 1965. This legislation, more commonly known as the No Child Left Behind (NCLB) Act, seeks to improve the system of public education in the nation by establishing (1) high standards for achievement of all students; (2) strong accountability for results; (3) proven educational methods; (4) parental choice; and (5) more freedom for states and communities (Bush, 2001; Page, 2001). As a result of this legislation, educational reform has again emerged as a robust topic of discussion in the nation.

School districts across the nation rush to realign curriculum and to adopt new initiatives to address the test-driven accountability mandates of the federal legislation. The responsibility of implementing these initiatives falls on each school and the individual teachers in those schools. This study investigated the implementation of such curriculum initiatives focusing specifically on the school context and the individual teacher. The ethnographic design explored themes and patterns in (1) school culture; (2) leadership; (3) teacher's attitudes, beliefs, and concerns about test-driven accountability; (4) the implementation of the curriculum initiatives; and (5) student achievement.

Educational Reform

Educational reform is not a new topic on the national agenda. In 1983, the National Commission on Excellence in Education escalated the national debate about the improvement of public education with the release of *A Nation at Risk*. The report begins simply with the statement, “Our nation is at risk” (p. 5) then enumerates both indicators and consequences of a failing educational system in the nation (National Commission of Excellence in Education, 1983). Since the release of *A Nation at Risk*, significant attention has been given to measuring the performance of American students with such indicators as the National Assessment of Educational Progress (NAEP) and the Third International Mathematics and Science Study (TIMSS). NAEP, also known as The Nation’s Report Card, measures performance levels and trends in achievement in different disciplines between states and population subgroups (Braswell, Lutkus, Grigg, Santapau, Tay-Lim, & Johnson, 2001). TIMSS compares the American system of education to educational systems of other countries by reporting student achievement at different levels within the educational system (Mullis, Martin, Beaton, Gonzalez, Kelly, & Smith, 1998). The results of these indicators have identified a variety of achievement gaps both within the nation’s school age population and between American children and those of other nations (Braswell et al., 2001; Mullis et al., 1998). TIMSS reports American twelfth grade students ranked 19 out of 21 nations participating in the mathematics portion of the study (Takahari, Gonzales, Frase, & Hersh-Salganik, 1998). While NAEP data identifies a 30 to 40 point achievement gap in mathematics between the nation’s white and black students at both grade four and grade eight (U.S. Department of Education, 2004).

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Public Perception

While the conclusions of *A Nation at Risk* and the validity of NAEP and TIMSS results are contested (e.g., Bracey, 2000; Bracey, 2003a), the debate is beyond the scope of this study. Regardless, these national indicators of student achievement have contributed to both the public and political dissatisfaction with the nation's system of public education (Bracey, 2003b). In the *Thirty-fifth Annual Phi Delta Kappa/Gallup Poll of the Public's Attitudes toward the Public Schools*, only two percent assigned the nation's public schools a grade of "A" while a 52 percent majority rated them average (Rose & Gallup, 2003). It is the dissatisfaction with public education and the concern for the future consequences of mediocre student performance that is the impetus behind NCLB and the societal setting for this study.

Educational Improvement and Change

During the second half of the twentieth century, the improvement of the nation's educational system has been a topic of both conceptual and empirical literature. Literature on the topic of educational change falls under a multitude of descriptions including (1) educational change, (2) educational reform, (3) educational improvement, and (4) organizational change. This body of literature represents works ranging from national education policy reform down to conditions affecting individual teacher adoption of a specific innovation. This study focused on the latter.

Prior to the passage of the NCLB legislation in 2002, the *standards movement* of the 1990's dominated the educational reform literature (Zemelman, Daniels, & Hyde, 1998). In 1989, the National Council of Teachers of Mathematics (NCTM) published *Curriculum and Evaluation Standards for School Mathematics* setting high expectations for not only *What* is taught in schools but also *How* it should be taught. This publication and its 2000 revision, *Principles and Standards for School Mathematics*, are considered a comprehensive set of *Best Practices* for the teaching and learning of mathematics (Zemelman et al.). In detailing *What* is to be taught in K-12 mathematics education, the NCTM standards enumerate the content standards of (1) numbers and operations; (2) algebra; (3) geometry; (4) measurement; (5) data analysis and probability; (6) problem solving; (7) reasoning and proof; (8) communication; (9) connections; and (10) representation while presenting a map of identifying student performance expectations at different levels of the K-12 educational system (National Council of Teachers of Mathematics, 2000).

The NCTM standards did not only establish a clear set of goals for mathematics education but also articulated a path to obtaining those goals by incorporating what Zemelman et al. describe as *Principles of Best Practice Learning*. These Best Practices include a series of "interlocking principles, assumptions, or theories" (Zemelman et al., 1998, p. 7) backed by educational research designed to foster a deeper understanding during the learning process. The Best Practices include the ideas that learning should be: (1) student-centered; (2) experimental; (3) holistic; (4) authentic; (5) expressive; (6) reflective; (7) social; (8) collaborative; (9) democratic; (10) cognitive; (11) developmental; (12) constructivist; and (13) challenging (Zemelman et al.).

For nearly 20 years, the NCTM Principles and Standards have served as a set of guiding Best Practices for the teaching and assessment of mathematics in the nation's K-

12 educational system. With the adoption of the test-driven accountability components of the NCLB legislation in 2002, the nation's schools - along with individual teachers - are now faced with the additional criteria of measuring student achievement.

Test-driven Accountability

NCLB is the first national reform effort incorporating a test-driven accountability system. One of the many mandates of the NCLB legislation includes the requirement of standardized testing for all students in grades three through eight in mathematics. If a school population, or any subpopulation within that school, fails to meet set proficiency levels on these assessments, the school progresses through a series of corrective sanctions such as school choice and the reallocation of federal funds aimed at improving student achievement.

In the Commonwealth of Pennsylvania, the Pennsylvania System of School Assessment (PSSA) is used to meet the mathematic assessment requirements of NCLB. Presently, all third, fifth, eighth, and eleventh grade students in public schools in the Commonwealth participate in the mathematics assessment. Grades four, six, and seven were included in the assessment beginning with the 2005-2006 school year. As new assessments are established in each grade, the curriculum standards to which the assessments are linked become more apparent, giving districts clearer expectations of student knowledge requirements at each grade level. In an attempt to improve student performance, districts around the state rush to realign their grade level mathematics curriculums and provide teachers with support to better address the standards being assessed by the PSSA at that particular grade. In addition to these initiatives, the teachers' ability to address the curriculum in the order, pace, and depth of their choosing has also been changed with the introduction of the more precise Scope and Sequences requirements stipulating a more inflexible routine of mathematics instruction. These *Scope and Sequence* initiatives require teachers to progress through designated curriculum topics at a regimented pace. In some instances, these initiatives are contrary to the established Best Practices for the teaching and learning of mathematics. Moreover, these initiatives are increasingly becoming the focus of school leadership and new curricular support efforts. In combination, these district level initiatives represent significant change for those classrooms teachers expected to implement them.

The Mathematics Curriculum Initiatives

In addition to the realignment of the mathematics curriculum and the introduction of the less flexible Scope and Sequence requirement discussed previously, this study focused on a number of other initiatives designed to improve student performance at the eighth grade level as a result of the new test-driven accountability mandates of NCLB including:

(1) The restructuring of a block of time previously used for non-instructional purposes to provide additional mathematics instructional support to academically at-risk students.

(2) The introduction of a Mathematics Coach to provide in-classroom support for teachers during their regular mathematics classes and during the restructured

block of time designed to provide additional support to academically at-risk students.

(3) The availability of additional resource materials specifically designed to focus teachers' instructional practices to match the standards used for assessment at the eighth grade level by the test-driven accountability system.

In concert, these initiatives marked a significant departure from existing instructional and organizational practices of the teachers and schools involved in the study. In some cases, the initiatives under investigation in this study required teachers to change their instructional practices requiring them to move away from what they believe to be the Best Practices for the teaching and learning of mathematics. This conflict between teachers' existing values and beliefs about the teaching and learning of mathematics and the changes required by the new mathematics curriculum initiatives was a component of this study.

Concerns-based Adoption Model of Change

The underlying objective of educational reform is to improve the nation's system of public education. The ultimate result desired from the improvement of the nation's system of public education is an increase in student achievement. Increasing student achievement requires changing current conditions and practices within each of the nation's schools (Hall & Hord, 2001; Harris & Hopkins, 2001). These changes in current conditions and practices must be adopted by individual teachers (Fullan & Hargreaves, 1998; O'Day, 2002). Therefore, the success of any reform effort, regardless of its origin, is contingent upon the adoption process in the context of the school environment (Hall & Hord, 1987). There is a considerable amount of support indicating the importance of the individual school and teachers in this adoption process. Ellsworth (2001) points out that "…innovations are adopted or rejected not only at the system level, but at the individual level…" (p. 146). Consequently, in an educational system, the basic unit of change in any reform movement designed to improve student achievement is the individual teacher in the context of their school environment (Eisner, 1998; Hall & Hord, 1987). Many individual teachers presently face the challenge of implementing curriculum initiatives designed to meet the test-driven accountability mandates of NCLB marking a significant change in teaching and learning expectations.

The conceptual and empirical literature on education change presents and tests a multitude of models and theories (e.g., Duke, 2003; Ellsworth, 2001). One such model of change specifically addresses the individual teacher's adoption process in the context of the school culture. First developed in 1973 by Hall, Wallace, and Dossett and later refined by Hall and Hord (1987; 2001), the Concerns-based Adoption Model (CBAM) emphasizes that, "change is a process, not an event" (p. 4). In order to facilitate the change/adoption process, significant attention needs to be given to the adopters' (teachers') individual needs and concerns during the adoption process. Specifically, the model stresses the importance of the teachers' perception of the change initiative in terms of (1) how it affects them personally; (2) how it affects them professionally; and (3) how it affects their students (Hall & Hord, 1987). The research-based CBAM proposes that teachers progress predictably through measurable *Stages of Concern* during the adoption process and, more importantly, that these *Stages of Concern* can be used in part to gauge the progress on the initiative being adopted (Hall, George, & Rutherford, 1998). Moreover, Hall and Hord (2001) state that these teacher perceptions of the change initiative are influenced by elements of (1) school ecology; (2) school culture; and (3) school leadership and support. The theoretical framework of the CBAM has noteworthy support in the areas of (1) the teacher's role in adoption process (e.g., Hall & Hord, 2001); (2) the impact of school ecology (e.g., Boyd, 1992) and school culture (e.g., Deal & Peterson, 1999) on the adoption process; and (3) the importance of school leadership and support during the adoption process (e.g., Duke, 2003). The CBAM focuses not on the mission, goals, conceptualization, or introduction of the initiative, but instead addresses the implementation phase of the adoption process after the initiative's initial introduction; in essence, picking up where other models leave off. This model served as a foundation as this study investigated the adoption process of mathematics curriculum initiatives in the complexity of the school environment from the perspective of individual teachers.

Problem Statement

District level curriculum initiatives frequently fail during their implementation due to interrelated factors within the organizational context of the school (Sarason, 1990). Specifically, the contextual factors of school culture; individual teacher's attitudes, beliefs and concerns; and leadership influence the implementation of the mathematics curriculum initiatives. The lack of understanding of how these contextual factors are related to each other and to the implementation of curriculum initiatives presents a significant barrier to changing instructional practice in the classroom. Until there is a better understanding of how teachers and school contextual factors affect the implementation process, curriculum reform initiatives will continue to be largely ineffective in improving student achievement (Sarason, 1990).

General Research Questions

The broad question of this study was what are the relationships between the implementation of mathematics curriculum initiatives; student achievement on state assessments; school culture; school leadership; and teacher's attitudes, beliefs, and concerns about test-driven accountability. This general question led to several interrelated sub-questions:

1. How did teacher's attitudes, beliefs, and concerns about test-driven accountability relate to the implementation of mathematics curriculum initiatives?
2. How did a teacher's implementation of mathematics curriculum initiatives relate to student achievement on state assessments?
3. How did teacher's attitudes, beliefs, and concerns about test-driven accountability relate to student achievement on state assessment?
4. What was the influence of principal and curriculum leadership on teachers' attitudes, beliefs, and concerns?
5. What was the influence of school culture on teachers' attitudes, beliefs, and concerns?

Potential Significance of the Study

The underlying philosophy of the present educational reform initiative is that national standards, teacher competency, and school accountability will result in improved student achievement. While the conceptualization of this reform initiative takes place at the national, state and district levels, the implementation of the mandates are carried out by teachers in their individual classrooms and schools (Hall & Hord, 2001). The success or failure of these initiatives is contingent upon their implementation in the school setting by individual teachers. Sarason (1990) suggests "…the failure of educational reform derives from a most superficial conception of how complicated settings are organized: their structure, their dynamics, their power relationships, and their underlying values and axioms" (p. 4). This study aims to provide practitioners with a better understanding of the interrelated factors within a teacher's work environment as they relate to the implementation of mathematics curriculum initiatives.

In his seminal work *Diffusion of Innovation,* Rogers (1995) defines the adoption process as *diffusion* stating, "Diffusion is the process by which innovation [a new idea] is communicated through certain channels over time among the members of a social system" (p. 5). The elements of Roger's definition parallel the thinking of Sarason and the framework of the CBAM. Moreover, Rogers also defines an *innovation* as "an idea, practice, or object that is *perceived* [italics added] as new by an individual or unit of adoption" (p. 11). Given this element of *perceived newness* as the key, the curriculum initiatives investigated in this study were in fact innovations to many of those teachers being asked to adopt them. Furthermore, an argument can be made that the test-driven accountability system established by NCLB is itself an innovation and as a result, will follow Roger's diffusion process as it is adopted (or not adopted) in a school.

The current educational reform movement has focused attention solely on student achievement magnifying the importance of the role of the individual teachers, school leadership, and school culture on the adoption process. The mathematics curriculum initiatives examined in this study are rooted in NCLB mandates. These initiatives are designed to improve student achievement on standardized assessments. The success of these initiative adoptions – and theoretically, student achievement – is significantly influenced by the individual adopters (teachers). Sarason (1990) discusses the importance of the school culture and of understanding the relationship between its members in pointing to the predictable failing of educational reform initiatives; he states

> …the classroom, and the school, and the school system generally, are not comprehensible unless you flush out the power relationships that inform and control the behavior of everyone in these settings. Ignore those relationships, leave unexamined their rationale, and the existing system will defeat efforts at reform. (p. 7)

As a result, the school contextual factors influencing the implementation of curriculum initiatives and student achievement under test-driven accountability conditions merit investigation.

Recent polls indicate that the American public supports the embedded philosophies in the NCLB legislation; namely, (1) high standards for achievement of all students; (2) strong accountability for results; (3) proven educational methods; (4) parental choice; and (5) more freedom for states and communities. Sixty-two percent of parents with children in school believe NCLB is "A good thing" and 72 percent favor requiring all 50 states to use a nationally standardized test to track student progress in grades three through eight (Rose & Gallup, 2003). Though the ideas of imposing high standards of achievement for all students and strong accountability for results seem widely accepted, empirical research supporting such a program's ability to improve student achievement is minimal (e.g., Amrein & Berliner, 2002b). Much of the available literature in the area presents conflicting evidence, as much of it is skewed by political and ideological agendas and funding.

Given the importance of the role of the teacher in the success of an initiative coupled with the complexity of both the change process and the school environment, the addition of test-driven accountability mandates to this environment creates a unique opportunity to investigate the role of individual teacher's attitudes, beliefs, and concerns; school culture; and leadership on the adoption process. Past studies have focused primarily on voluntary adoptions and teacher autonomy, the present test-driven accountability environment shifts a significant variable in the existing body of literature away from voluntary participation to top-down, mandated initiatives.

In citing Goodlad's 1984 work, *A Place Called School*, Sarason (1990) points out that "…despite the many and obvious ways in which schools differ, they are amazingly similar in terms of classroom organization, atmosphere and rationale for learning" (p. 7). This similarity in the structure of schools may increase the likelihood that the results of the study can be applied to other educational settings. This study investigated the relationship between (1) teacher's attitudes, beliefs, and concerns about test-driven accountability; (2) teacher's implementation of mathematics curriculum initiatives; (3)

student achievement of state standardized assessment; (4) school culture; and (5) leadership and curriculum support. The findings contributed to the existing knowledge in the area of educational reform policy. Narrowing the focus, results of this study may also change prevailing beliefs of educational practitioners as to the importance of understanding and addressing teacher's attitudes, beliefs, and concerns during the curriculum initiative implementation.

Statement of Purpose

The purpose of this primarily qualitative mixed method study was to explore and discover themes and patterns during the implementation of mathematics curriculum initiatives in the context of today's test-driven accountability environment. Specifically, the study investigated relationships between the contextual factors of school culture; teacher's attitudes, beliefs, and concerns; and leadership as they were related to the implementation of mathematics curriculum initiatives and student achievement in a test-driven accountability environment. The mathematics curriculum initiatives under investigation included: (1) realigning curriculum to cover eligible mathematics concepts on the state assessment; (2) providing additional instruction to academically at-risk students; and (3) providing in-classroom instructional support to teachers of mathematics.

In the broad qualitative design, an ethnographic exploration by a participant observer was used to investigate the adoption process of math curriculum initiatives recording the complex interaction of (1) school culture; (2) teacher's attitudes, beliefs, and concerns; (3) and leadership factors. Eighth grade mathematics teachers and learning support teachers in four middle schools in the Neshaminy School District were asked to participate in the study. The participant observer served in the leadership and support role of Middle School Mathematics Coach designed to provide curriculum support on the implementation of initiatives intended to improve student achievement on state assessment. The researcher was immersed in each school culture by working with the teachers on a weekly basis over a period of several months in the typical school and classroom settings. After the immersion was accomplished, informal interviews and observations of teachers and school leaders were conducted over a three-month period following the administration of the state assessment. The theoretical framework of the CBAM provided guidance to the participant observer as teacher's attitudes, beliefs, and concerns were probed to determine implementation problems. As a result of these probes, support was targeted to overcome the problems in order to facilitate the implementation of the curriculum initiatives. The analysis of the data examined patterns and themes within the ethnographic findings in each contextual area in relation to implementation levels and student achievement scores on state mathematics assessments.

Concurrent to the qualitative exploration, a cross-sectional survey (Wiersma, 2000) was employed to further explain relationships between teacher's attitudes, beliefs, and concerns about the test-driven accountability; their implementation of the curriculum initiatives and students' achievement results of standardized assessments. Eighth grade mathematics teachers and learning support teachers in the four middle schools were asked to participate in the Stages of Concern Questionnaire (SoCQ) (Hall & Hord, 2001) to determine their individual concerns regarding the states test-driven accountability system. Results of the Stages of Concern Questionnaire were compared to each teacher's level of implementation and student PSSA scores in mathematics as reported by the Pennsylvania

Department of Education (PDE). A casual comparison analysis of the teacher's Stages of Concern; their level of implementation; and students' assessment scores was used to determine relationships between the sets of data.

The concurrent nested mixed method design (Creswell, 2003) using quantitative analysis embedded in a larger qualitative exploration better explained the interaction of teacher's attitudes, beliefs, and concerns; school culture; and school leadership on the implementation of initiatives aimed at improving students' state assessment scores. The quantitative elements centered on the norm-referenced student PSSA scores and the independently validated SoCQ fostered internal reliability and validity of the findings by triangulating the interview and observation data through additional instruments of inquiry (Wiersma, 2000). At the same time, the ethnographic exploration documented the complexity of the adoption process within the school culture. Moreover, the flexibility of the concurrent nested design facilitated exploration of unanticipated questions as they emerged during the investigation. The ethnographic design helped identify unforeseen consequences of top-down curriculum initiatives that were only apparent to the classroom teacher within the context of the individual school culture.

Operational Definitions

While mathematics curriculum initiatives under investigation in this study were easily delineated by name, their individual effect on student achievement and teacher's attitudes, beliefs and concerns was impossible to separate. As a result, the definition of mathematics curriculum initiatives in the study were loosely defined as all recent mathematics initiatives aimed at improving student achievement on state assessments.

The initiatives included, but were not limited to: (1) curriculum realignment; (2) identification and remediation of academically at-risk students; and (3) in-classroom curriculum and instructional support from a middle-level Mathematics Coach. The impact of each initiative was not measured separately but instead, their combined influence on student achievement and teacher's attitudes, beliefs, and concerns was explored.

The component of leadership and curriculum support was also loosely defined to include those persons in the position of principal, assistant principal, department chairperson, and building curriculum specialists. However, the study did not limit the investigation to these individuals citing Elmore's (2000) idea of distributed leadership within the effective school cultures. The study's ethnographic design allowed for the inclusion of less formal forms of teacher leadership that influenced the implementation process.

Student achievement and measurement of learning is in itself a complex issue. For purposes of this study, student achievement and its measurement were defined as student performance on the mathematics section of state standardized assessments. Details of the PSSA and student scores will be addressed during the discussion of the research design in chapter three.

The concepts of (1) innovation, (2) initiative, (3) adoption, (4) adoption process, (5) implementation, (6) diffusion, and (7) institutionalization need to be delineated. While these terms are at times used interchangeably throughout the literature, this study used specific operational definitions for each. Figure 1 presents a visual representation of the uniqueness along with the interconnectivity of each of the terms.

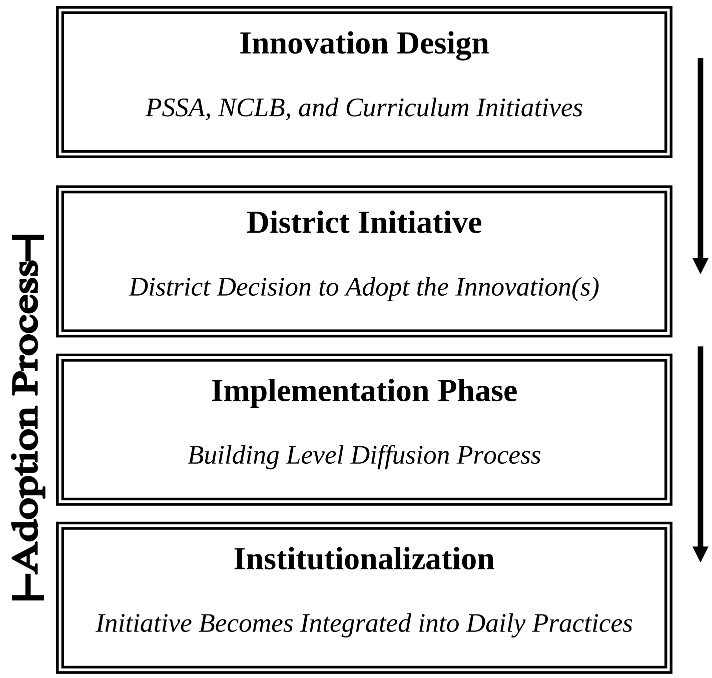


Figure 1. Overview of the Adoption Process.

Again, Rogers (1995) defines an *innovation* as an idea, practice, or object perceived as new by an individual. This definition is also supported by the more common dictionary definition of the word as "something newly introduced" (Morris, 1982, p. 663). The existence of the innovation marks the starting point of the change process. This starting point is followed by the governing body's decision to adopt the innovation. Therefore, the term *adoption* will be defined using the common dictionary definition of "to choose as a standard" (Morris, 1982, p. 80). This decision to adopt is also synonymous with the term *initiative*. As defined by the American Heritage Dictionary (1982), *initiative* is "the power to introduce a new legislative measure" (p. 662). For the purpose of this review, the terms adoption and initiative will be used interchangeably to indicate the governing body's decision to introduce – or impose - an innovation on the system. In an educational system, the governing body can exist at the district, state, or national level.

The governing body's decision to introduce the innovation on the system marks the beginning of the *adoption process*. The adoption process represents the events starting with the adoption of the innovation continuing through the *implementation* phase and theoretically concludes with the *institutionalization* of the innovation. *Institutionalization* is a state when the innovation has become "established and set in daily operation" (Morris, 1982, p. 666). It is the complexity of the adoption process, specifically the period between the decision to adopt the innovation and its ultimate institutionalization that was the focus of this study. Between these two extremes lies the *implementation* phase. Rogers (1995) defines the *implementation* phase as the process of *diffusion* "by which an innovation is communicated through certain channels over time among the members of a social system" (p. 5). While Rogers' definition describes this process in very general terms that can be applied to a broad array of systems and organizations, this study narrowed the definition to the diffusion process at the individual building level.

In the context of this study, the innovation was represented by the test-driven accountability system. The adoption or initiative was represented by the decision to impose the federal NCLB legislation on the nation's public schools. Within this larger reform initiative were multiple smaller initiatives designed by states and local districts to address the provisions of the NCLB legislation. Within the complex school context, it was difficult to delineate between the larger innovation and those smaller initiatives resulting from its mandates. These resulting initiatives took the form of adoptions such as Pennsylvania's PSSA and local districts' curriculum realignment and modified curriculum scope and sequences.

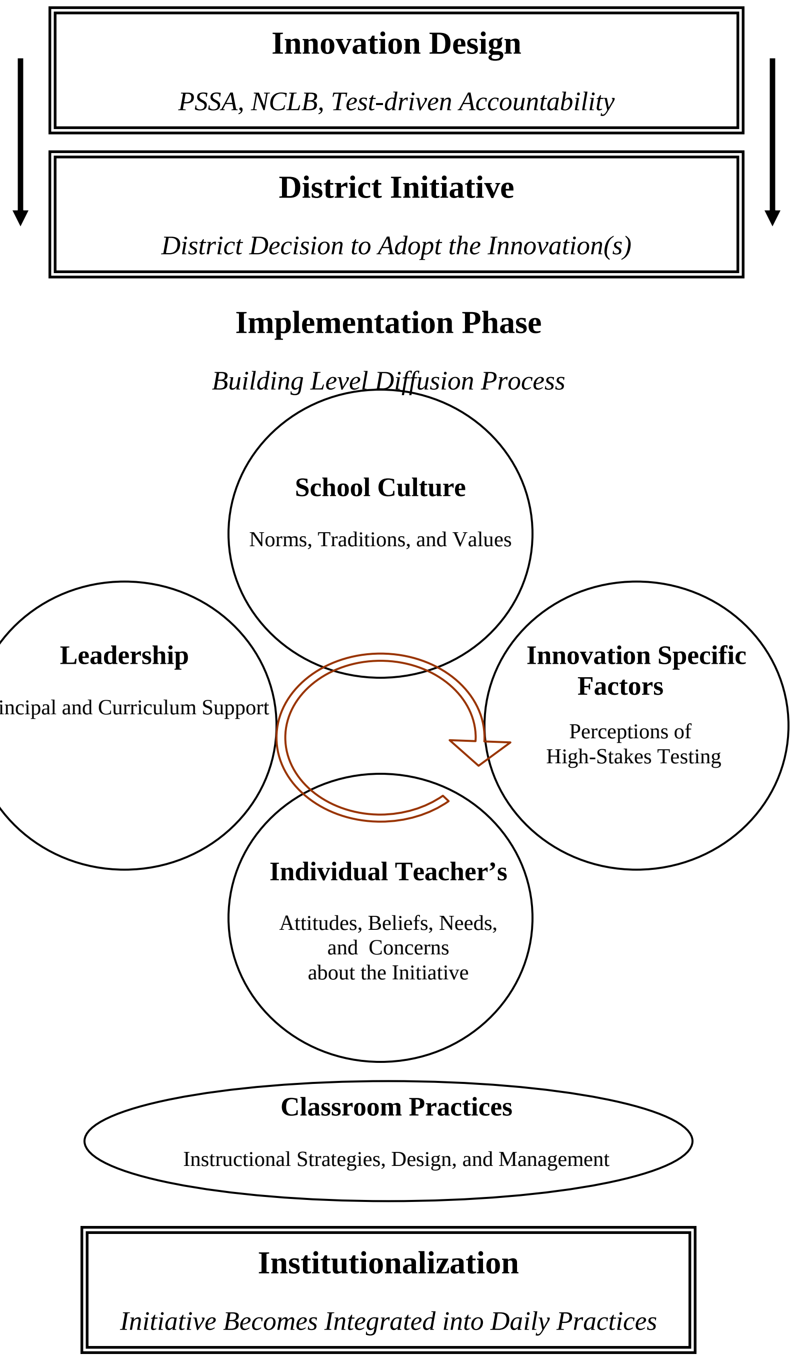


Figure 2. Conceptual Framework: Implementation Phase of the Adoption Process.

In this study, the *social system* described by Rogers was embodied by the existing school culture while the *communication* he discusses involved the interaction between individual teachers and their leaders regarding the initiatives of test-driven accountability within that school's culture. Figure 2 represents an expansion of the previous diagram to include the interaction of the elements in the implementation phase. Specifically, the effects of (1) the school's culture; (2) school and curriculum leadership; (3) the mandates of test-driven accountability; (4) and teacher's attitudes, beliefs, and concerns on individual classroom practices and student achievement. This expanded model represents a synthesis of the literature on the implementation of educational initiatives along with the researcher's own experiences. The model served as a conceptual framework for this study.

Delimitations of the Study

While exploring the factors influencing the implementation of mathematics curriculum initiatives in a test-driven accountability environment, the study was subject to the following delimitations:

1. The study of *change* is the subject of volumes of literature in the area of business, social sciences, and education. The topic is addressed extensively by motivational, conceptual, and empirical works in all areas. This study limited the review of the literature to the topic of educational change.
2. Within the topic of educational change, the study primarily focused on the CBAM; one of the many models of educational change. The study was not intended to validate the CBAM or the Stages of Concern Questionnaire.

3. The population of students and teachers in this study was limited to four middle schools in a middle-class suburban school district. Teacher participation in the investigation was on a volunteer basis.

4. In addition, the population in the study was further limited to those teachers involved in the Grade 8 PSSA Mathematics Assessment.

5. Though Goodlad (1984) finds general similarities between school environments, the cultural setting of the study was unique in terms of the curriculum leadership hierarchy/structure of one middle-class suburban school district.

6. The study's nested cross-sectional survey design did not examine any longitudinal aspects of the research questions.

The study's ability to be generalized to other educational settings was limited by the above delimitations along with the unique societal and political setting at the time of the study. Additionally, the qualitative data gathered by the participant observer may be subject to other interpretations thereby reducing the degree of external reliability of the results (Wiersma, 2003). Therefore, generalizing the results to other schools, standardized assessments, grades, and subject areas may not be possible.

CHAPTER TWO: REVIEW OF LITERATURE

Overview

This review outlines an argument grounded in the existing literature in support of this study's research hypothesis that teacher's attitudes, beliefs, and concerns about curriculum initiatives linked to systems of test-driven accountability influences students' performance on standardized assessments. The review addresses the major factors that influence a teacher's decision to implement an educational initiative with specific focus on the school environment. There exists a significant volume of literature addressing the importance of the school culture, individual teacher values and beliefs, and school leadership on the implementation of educational initiatives. The literature also alludes to the complexity of large organizations (e.g., Stacey, 2000) along with a lack of clear understanding as to how the interrelated facets of school culture, individual teachers, and leadership support impact the implementation on these initiatives. With the passage of the NCLB legislation in January 2002, the context became even more complicated as now, for the first time, the school context includes a system of test-driven accountability mandated from the state and national levels. Test-driven accountability initiatives represent the addition of a major new variable in the already complex school environment. Moreover, the mandatory nature of this top-down reform marks a noteworthy departure from the existing body of research on voluntary initiative implementation.

This review focuses on the implementation phase of the initiative adoption process; specifically addressing the building-level diffusion process of mathematics curriculum initiatives. The contention of the research in this study was that district curriculum initiatives designed to address the test-driven accountability mandates of NCLB faced significant resistance in their implementation phase at the individual building level. This resistance stems from a complex interaction of the existing school culture; individual teacher's values and beliefs; leadership factors; and concerns about the merits of the test-driven accountability systems itself. Furthermore, this study contended that this resistance could be measured and related to student achievement scores on state assessments.

In support of these hypotheses, the review will be organized as described in Table 1. The review will first provide an overview of educational reform literature identifying reasons within the adoption process, specifically the implementation phase, for the long history of failed initiatives. The review then narrows to literature on leadership, school culture, test-driven accountability, and the individual teacher's role in the implementation process. After synthesizing the literature on each of these elements, the review will present support linking the elements of leadership, school culture, and individual teacher's concerns to student achievement. In addition, the Concerns-Based Adoption Model will be given considerable attention as its design focuses on the importance of the individual teacher attitudes, beliefs, and concerns during the implementation phase.

In essence, the goal of this review is to present a comprehensive synthesis of both conceptual and empirical literature on the implementation process of educational initiatives while outlining an argument supporting the study's conceptual framework that school culture; leadership; and teacher's attitudes, beliefs, and concerns about mathematic curriculum initiatives in a test-driven accountability system influence the implementation of these initiatives and student performance on state assessments.

Table 1

Overview of the Literature Review

SECTIONS	PURPOSE AND FUNCTION
Importance of School Context on Implementation	This section provides research support for the Significance of the Study as presented in Chapter One by discussing the history of failed educational reform initiatives. The section will identify gaps in existing research while articulating the study's potential contribution to the better understanding of the interrelated factors of school context.
Conceptual Framework of the Study	This section frames the study by presenting the researcher's conceptualization of the implementation process. The section limits the study's focus to the components of school culture that influence implementation.
School Factors Influencing Implementation	This section provides literature support for the study's conceptual framework described in the previous section. Each of the factors influencing implementation will be addressed in separate subsections.
School Culture	This subsection presents the conceptual and empirical research on school culture as related to implementation in support of the study's conceptual framework and research question #5, which addresses the effect of school culture on teacher's attitudes, beliefs, and concerns.
The Individual Teacher: Attitudes, Beliefs, and Concerns	This subsection presents the conceptual and empirical research on research question #1, which addresses the effect of teacher's attitudes, beliefs, and concerns on implementation.
Outcomes and Perceptions of Test-driven Accountability	This subsection continues presenting research related to research question #1 by discussing how test-driven accountability influences teacher's attitudes, beliefs, and concerns. The conceptual and empirical research on the test-driven accountability systems along with teacher's perceptions of such systems is presented.
Leadership	This subsection presents the literature on leadership as related to implementation in support of the study's conceptual framework and research question #4, which addresses the effect of leadership on teacher's attitudes, beliefs, and concerns.
Student Achievement	The section continues the presentation of literature in support of the study's conceptual framework as related to student achievement. The subsections link the implementation of standards-based curriculum and school contextual factors to student achievement.
Standards-based Curriculum Initiatives and Student Achievement	This subsection presents literature on standards-based curriculum's ability to improve student performance in support of the study's conceptual framework and research question #2, which addresses the relation between implementation levels and student achievement.
Contextual Factors and Student Achievement	The subsection presents the literature connecting the contextual factors of school culture, leadership, and teacher's attitudes, beliefs, and concerns to student achievement in support of research question #3.

Importance of School Context on Implementation

With an overview of the process of change in place, the following section will focus the discussion on the importance of the school's environment or *context* in the change process. The term *School Context* has come to have a specific meaning in the literature. Both Hargreaves, Earl, Moore, and Manning (2001) and Hall and Hord (2001) concur with Boyd's 1992 definition of school context. As defined by Boyd, school context consists of the two fundamental components of school ecology and school culture (see Figure 3). School ecology factors include (1) the availability of resources; (2) physical aspects of the school; (3) student and teacher demographics; and (4) local, state, and federal policies (Boyd, 1992; Hall & Hord, 2001). Unfortunately, the term school culture is frequently used in the literature carelessly to describe elements of the school ecology. Reciprocally, context is often used to describe components of school culture. For the purpose of this study, the elements of school culture were less tangible but include the system of relationships and shared norms, attitudes, and beliefs within the school (Boyd, 1992). The elements of school culture and their importance on the adoption process will be addressed at length in a subsequent section of this chapter.

School Context	
School Ecology	**School Culture**
Resources Physical Conditions Demographics Policies Hierarchical Structures	Relationship Interactions Communication Characteristics Norms of Practices Shared Values and Beliefs

Figure 3. Components of School Context

There is considerable conceptual literature pointing to the importance of the individual school context in the success or failure of school improvement initiatives (e.g., Elmore, 1978; Kanter, 1998; Sarason, 1971). Simply stated, a major determining factor as to whether an educational initiative is implemented successfully or not is the school context in which the initiative is introduced. Moreover, the literature points to educational leaders' lack of understanding of this complex environment as a primary cause of many failed educational innovations. In the conclusion from a case study looking at schools involved in the Improve Quality of Education for All (IQEA) program in the United Kingdom, Hopkins (2001) summarizes his findings while also generalizing the conclusions of most of the literature available on the topic by stating, "Without a clear focus on internal conditions of school, improvement effort will quickly become marginalized" (p. 67).

The importance of school context in the success of the adoption process is not new. Conceptually, Sarason (1971) began discussing the idea that the cause of most failed educational innovations is rooted in a misunderstanding of school context. Sarason uses the term school culture but clearly is describing the broader elements of school context in his work. In his 1990 seminal work, *The Predictable Failure of Educational Reform*, Sarason points to both components of the school context as contributing to failed educational initiatives. He describes both the uniqueness and regularities of each school's culture influencing the adoption of new initiatives. In addition, Sarason describes present school structures that contribute to the system's intractability – resistance to change. Elmore (1978) provided additional support for the importance of school context proposing that the success of change initiatives is based on how the implementation process is embedded in the organization's hierarchical structure; a clear allusion to what Boyd (1992) defined later as school ecology.

The importance of context is also supported by works outside the field of education; in fact, this body of work is the foundation of educational literature on school context. As discussed previously, Roger (1995) points to the social system and channels of communication as a significant part of the diffusion process. Again, clear reference to the context in which the innovation is introduced. In discussing the adoption of an innovation, Kanter (1988) states, "Undeniably, innovation stems from individual talent and creativity. But whether or not individual skills are activated, exercised, supported and channeled into production of a new model that can be used, is a function of the organizational and interorganizational context" (p. 205). The importance of context on the success or failure of innovations is also a cornerstone of the thinking in the field of creativity (e.g., Amibile, 1988; Csikszentmihalyi, 1990; Sternberg & Lubart, 1991; Williams & Yang, 1999). Finally, as a follow-up to his seminal work, *The Fifth Discipline*, Senge (1999) writes "The fundamental flaw in most innovators' strategies is that they focus on their innovation … rather than on understanding how the larger culture, structures, and norms will react to their efforts" (p. 26). Again, Senge makes clear reference to the components of context – ecology and culture – as being important to implementation.

Using these works as a foundation, more recent literature addressing education specifically has begun stressing the importance of school context by identifying the individual school as the unit of focus in any reform efforts (Eisner, 1998; Hall & Hord, 2001; Harris & Hopkins, 2001; Henshaw, Wilson & Morefield, 1987; Hord, Rutherford, Huling-Austin & Hall, 1987; McLaughlin, 1998; O'Day, 2002; Sternberg, 2000). In stressing the importance of individual schools, Fullan (2001b) believes one of main reasons why most initiatives do not succeed is related to the failure to understand the local context. He states the lack of success is due to the "failure of reformers to go to the trouble of treating local context and culture as vital" (p. 99). While Fullan's definition of context is less specific than the one put forth by Body (1992), his discussion clearly points to school ecology and cultural factors. In one of the most recent works, Reeves (2002) proposes his *Law of Initiative Fatigue* stating that the effectiveness of an initiative is a function of available time, available resources, and the number of concurrent initiatives being adopted; all of which are elements of the individual school context.

In one of the earliest case studies, Gross, Giacquinta, and Bernstein (1971) identify the problems in the implementation phase of the adoption process stating that failure may be caused by "a truncated version of the change process held by …administrators" (p. 208). More recently, the lack of understanding of the complexity of the school context prompted Fink and Stoll (1998) in conclusion to their literature review to identify the research aimed at better understanding the school context as one of the most significant contributions from recent school improvement literature. Several studies identify that school contextual factors contribute to the success or failure of education initiatives (Corbett, Dawson & Firestone, 1984; Goodlad, 1984; Hargreaves, Earl, Moore, & Manning, 2001; Hawley, 1978; Heckman, 1987; Henshaw, 1987; Little, 1982; Louis & Miles, 1990; Mann, 1978; Marzano, 2003).

In the most comprehensive investigation involving school contextual factors to date, Goodlad (1984) explores for the first time not just the isolated components of the education process such as teaching methods and curriculum but instead examines the entire system of schooling. Using a mixed method research approach, Goodlad studied 38 schools in seven states involving thousands of student, teacher, and administrator surveys, interviews, and observations. In putting forth implications and recommendations of the research for school improvement initiatives, Goodlad discussed restructuring the system addressing a number of specific areas within this study's definition of school context. Specifically, in the area of school ecology, Goodlad made recommendations in the areas of (1) grade level restructuring; 2) the reorganization of teachers and use of time; (3) curriculum restructuring; and (4) student grouping and tracking practices. Though his work does not use the term school culture, the recommendations do point to what this study defines as school culture suggesting changes in the areas of (1) leadership; (2) collaboration; (3) instructional practices and (4) the decision-making process. While the goal of the study was to present an accurate description of the complexity of *schooling* in the nation, it empirically confirmed the early conceptual works of Sarason (1971) and Elmore (1978) as to the importance of understanding school contextual factors in the implementation of school improvement initiatives.

While Goodlad's work presented mostly broad implications for restructuring entire school systems, it left unanswered the questions addressed in this study regarding how individual school contextual factors relate to the success or failure of a particular improvement initiative. Addressing this issue more specifically, Louis and Miles (1990) examined five urban high schools as they implemented school improvement initiatives. They identified patterns related to the success of these improvement initiatives, which include preexisting school contextual factors. Specifically, the research delineated what it describes as external and internal contextual conditions influencing the implementation of the improvement initiatives in their case study. Again, most of the discussion related to external factors including (1) district level context, (2) the role of the state, and (3) community factors (Louis & Miles, 1990). However, the identification of internal context factor (i.e. school context as defined by this study) describes the influences of both school ecological structures, mainly its organization, and school cultural factors in the form of (1) staff cohesiveness; (2) preexisting attitudes and beliefs; and (3) elements of school leadership (Louis & Miles, 1990). Louis and Miles' work marks a significant contribution to recognizing the importance of individual school contextual factors in the success of educational improvement initiatives.

Unfortunately, the Louis and Miles research did not identify or attempt to control the specifics of the individual school improvement initiatives. The schools in the case study were selected not by the similarities in their school improvement initiatives but instead by their overall involvement in any improvement initiative and the school's commitment to improving student achievement (Louis & Miles, 1990).

Hargreaves, Earl, Moore, and Manning (2001) took a more precise look at the adoption process of educational improvement initiatives by qualitatively studying 29 teachers working in large school districts as they implemented new curriculum initiatives aimed at improving student achievement. Similar to this study, the improvement initiatives were the result of top-down test-driven accountability mandates. Unlike previous studies, the Hargreaves et al. research investigated conditions within individual schools influencing the implementation of these curriculum initiatives. The study identified elements of the individual school context that contribute to the implementation of curriculum initiatives.

Hargreaves et al. conclude: “The teachers in our study identified five major areas that significantly influenced their attempts to incorporate major policy changes into their daily routines and that were important for supporting and sustaining these change in their work…” (p. 160). The study articulates the importance of the elements of *school structure* such as (1) scheduling; (2) grading; and (3) the use of time and space; clear components of school ecology as defined by this study. More importantly, the other four areas numerated in the study of (1) teacher culture, (2) professional learning, (3) professional discretion, and (4) school leadership fall in the realm of this study’s definition of school culture. While a more thorough discussion of these areas will be presented in the School Culture section of this review, the Hargreaves et al. work provides additional empirical support for the importance of individual school context in the adoption process of curriculum reform initiatives.

In what is the most recent and comprehensive review of the literature on the topic of improving student achievement, Marzano (2003) concludes that the success of school improvement initiatives “is a highly contextualized phenomenon” (p. 158) and that implementation should look “substantively different from school to school” (p. 158). What is most noteworthy about Marzano’s finding is that it is one of only three principles of school reform resulting from his comprehensive synthesis of the research. Marzano identifies the emphasis of data-driven decision-making and the incremental nature of the change process along with the importance of school context as his three principles of school reform. In the discussion, Marzano further defines school contextual components that affect student achievement to include (1) school factors, (2) teacher factors, and (3) student factors. Additional details of Marzano's work will be discussed later in this review as the elements of school culture are linked to student achievement.

The history of failed educational reform initiatives is substantial and well documented, whether the initiative involves large-scale system reform or a particular educational innovation such as the integration of technology (e.g., Cuban, 2001; Hodas, 1993). It is also apparent from the evidence that no single implementation design will work within the complexity of each individual school's context. The elements of school context, both school ecology and school culture, play a major role in the success or failure of any educational initiative. This study sought to explain the influences of these complex elements on implementation by further exploring the elements of school culture. In continuing to outline the argument, now that the importance of understanding the context of the initiative has been established, the next sections will focus on the school culture aspect of school context.

Conceptual Framework of the Study

While the previous discussion clearly identifies both school ecology and school culture as important elements of the school context affecting the implementation of educational initiatives, the focus of this study was limited to the aspects of school culture shown in the literature to influence implementation; namely the influence of leadership and teacher's attitudes, beliefs, and concerns about the curriculum initiatives. The conceptual framework of this study – as supported by the literature combined with the researcher's personal experiences and observations - does not assume that school ecology and school culture are mutually exclusive components acting independently of one another. Instead this study contended that the implicit and underlying factors in determining the success or failure of an initiative, while embedded in school culture and influenced by school ecology, is the individual teacher's attitudes, beliefs, and concerns about the particular initiative (see Figure 4).

This study's contention was that the successful implementation of curriculum initiatives is highly dependent on an individual teacher's instructional practices. These classroom practices are a function of the teacher's personal attitudes, beliefs, and concerns about the curriculum initiatives. Therefore, these individual values and beliefs are influenced by the larger school culture and this school culture is affected by the even larger school, district, state, and national ecological factors. In essence, implementation is a function of an individual teacher's attitudes, beliefs, and concerns which is affected by an interaction with the other elements of school ecology and school culture. In a review of the literature, Boyd (1992) alludes to this complex interaction of contextual components while calling for further research stating:

> The literature supports the idea of these interrelationships [between the components of school context]. However, exactly how these factors affect each other is not clear in the research…Further research is needed to clarify exactly how these elements are interrelated and, indeed, what effect the various factors alone have on any other factor. In addition, there may be other elements that contribute to the interrelationship among the elements of context. (p. 79)

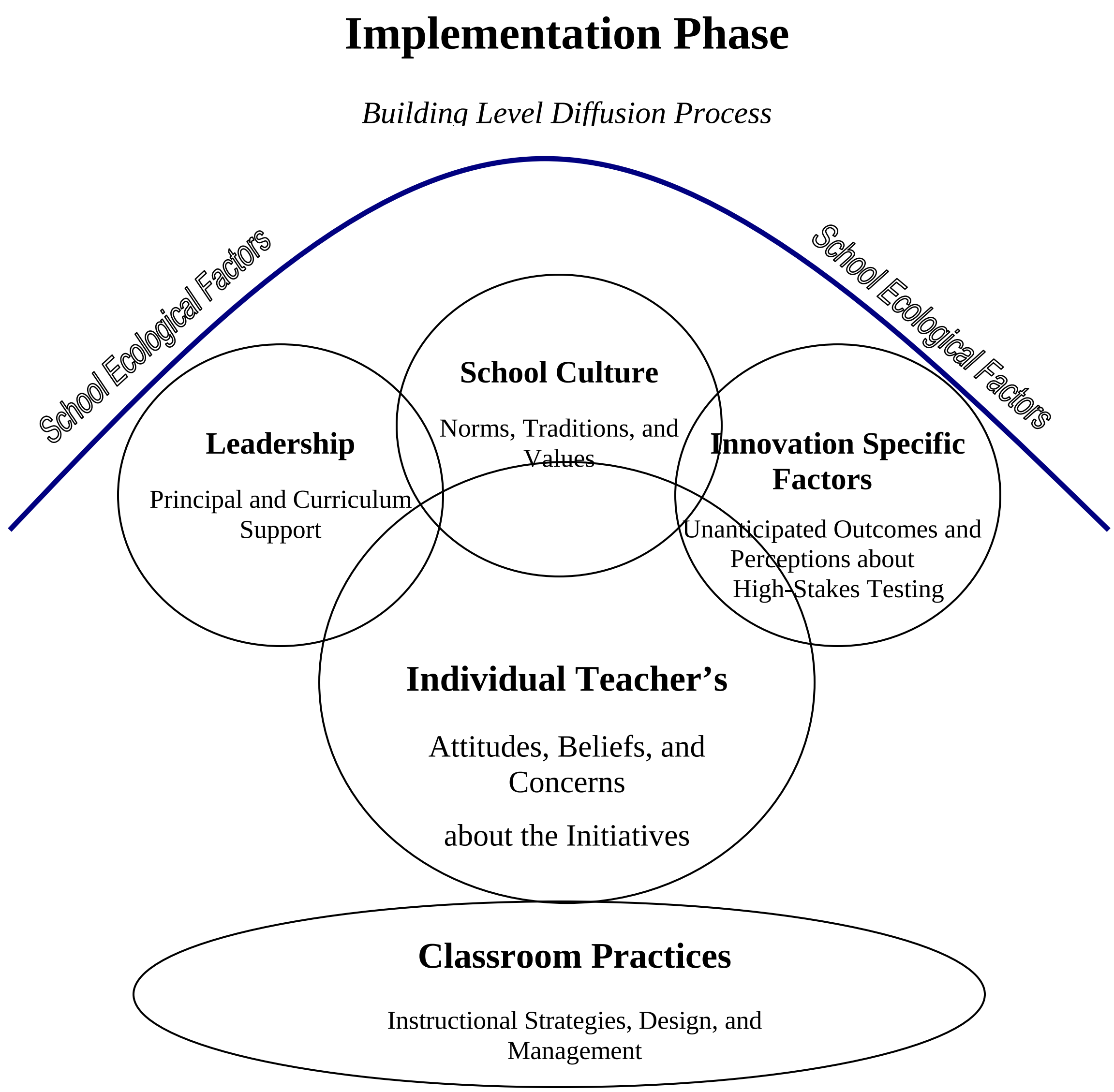


Figure 4. Enhanced Conceptual Framework of Implementation

This study hoped to expand the existing body of knowledge on the interrelatedness of these school contextual factors by identifying teacher's attitudes, beliefs, and concerns as a significant determining factor in the implementation of curriculum initiatives. By framing school, district, state, and national ecology as factors that influence the individual school culture, this study limited the scope of the investigation to the individual school culture alone. The research design set these larger structural variables as the contextual framework of the study by limiting the scope of the investigation to schools from one district operating under very similar district, state, and national ecological components.

School Factors Influencing Implementation

Given the research support for the influence of the individual school context on the implementation of initiatives (Corbett, Dawson & Firestone, 1984; Goodlad, 1984; Hargreaves, Earl, Moore, & Manning, 2001; Hawley, 1978; Heckman, 1987; Henshaw, 1987; Little, 1982; Louis & Miles, 1990; Mann, 1978; Marzano, 2003), this review will now address elements within the school context contributing to a school's culture. Hargreaves, Earl, Moore, and Manning (2001) conclude that "change can be initiated and imposed but only the deeper human capacity of *individuals and schools can sustain* [italic added] reform efforts over time" (p. 159). The mention of *individuals, schools,* and *sustainability* are specific references to what this study defines as teacher's classroom practices, school culture, and institutionalization of curriculum initiatives. It is the *individuals* to which Hargreaves et al. alludes to that were explored in this study.

As Boyd (1992) suggests, factors contributing to a school culture are complex and interrelated and include (1) shared attitudes and beliefs; (2) individual attitudes and beliefs; (3) norms; and (4) both staff and student relationships. This system of attitudes, beliefs, norms, and relationships is constantly evolving. There is also evidence to support that this evolution is influenced by leadership components within the school culture (Deal & Peterson, 1999; Heckman, 1987). Research also suggests that each new initiative introduced into the school culture also alters the attitudes, beliefs, norms, and relationships within that culture (Hawley, 1978). Figure 5 expands the framework of the argument within the realm of school culture depicting the interrelatedness of the elements contributing to and influenced by school culture. This study contended that the major factors contributing to the altered school culture and the ultimate implementation of the initiative are (1) the existing school culture at the time initiative is introduced; (2) leadership and support elements related to the initiative; (3) factors related to the specific initiative being introduced; and (4) individual teacher's attitudes, beliefs, and concerns about the particular initiative.

The following sections will address the importance of each of these elements: (1) the effect of school culture on the implementation of educational initiatives; (2) the importance of school leadership and support related to district curriculum initiatives; (3) the influence of teacher's attitudes, beliefs and concerns on their implementation of the initiatives; and (4) specific factors related to curriculum initiatives in a test-driven accountability environment.

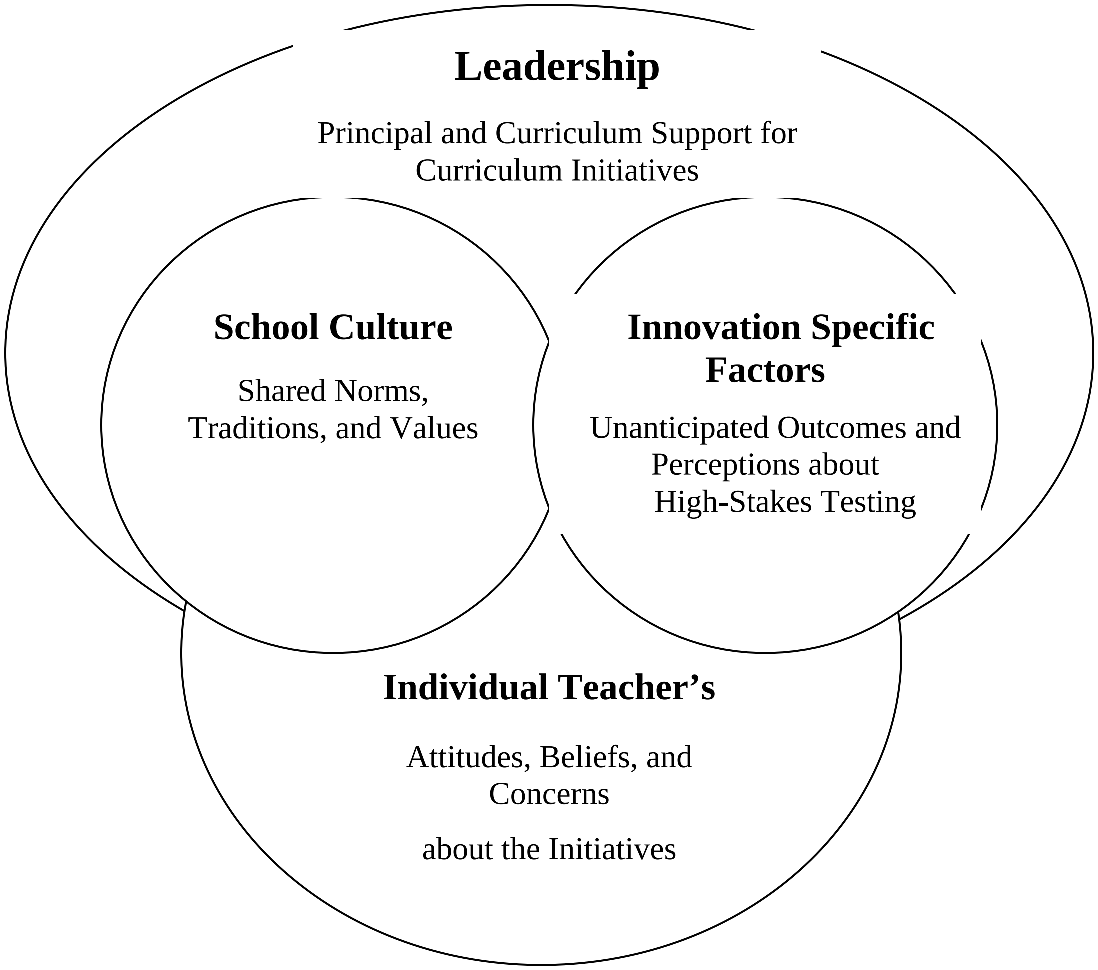


Figure 5. Conceptual Framework of the Factors Influencing Implementation.

School Culture

With the specific conceptual framework in place, this section will synthesize the literature on how school culture influences the implementation of educational initiatives (see Figure 6). According to Deal and Peterson (1999), "culture consists of the stable, underlying social meaning that shapes beliefs and behaviors over time" (p. 3). They further define school culture as a set of common (1) visions and values; (2) rituals and ceremonies; (3) architecture and artifacts; and (4) history that shape an individual's practices in a school. As stated previously, Boyd (1992) presents a somewhat simpler definition by numerating three components: (1) attitudes and beliefs of persons in the school; (2) norms of the school; and (3) relationship between persons in the school.

In both definitions, the scope of individuals involved in the system includes teachers, administrators, support staff, parents, and students. While recognizing the influences of each of these groups on school culture, for the purposes of this study, the review was limited to an adult professional school culture consisting of only teachers' and administrators' attitudes and beliefs, norms, and relationships.

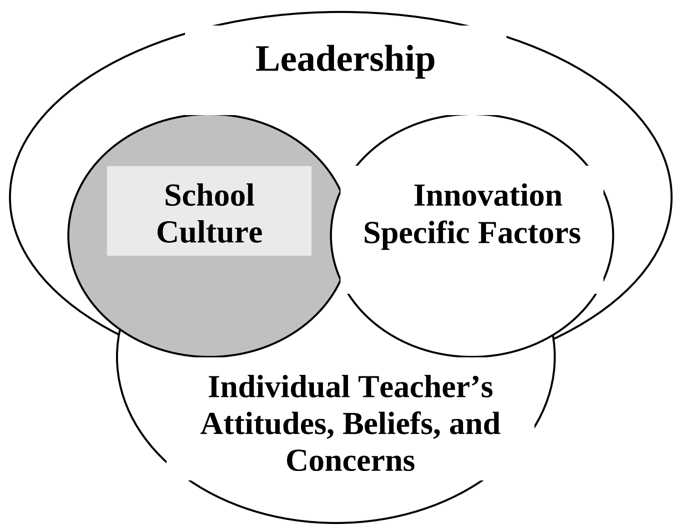


Figure 6. School Culture's Influence on Implementation.

The exploration of school culture has been a popular topic in the literature over the past decade. Derived from the study of *change*, school culture gained notable attention through the research on the contextual importance of the innovation adoption process. Much of the notable literature on the topic of school culture has already been presented in the broad discussion of school context; therefore, it will not be reiterated in this section. Clearly, certain positive elements of school culture are linked to successful school improvement initiatives while other less attractive facets of school culture can be connected to failed and struggling initiatives. O'Day (2002) states, "Normative structures in schools often are the determining factor in policy implementation and overall effectiveness" (p. 2). The influence of these normative structures – school culture – on the implementation of mathematics curriculum initiatives is the focus of this section.

Influence of School Culture on Improvement Initiatives

There is an abundance of both conceptual literature (e.g., Deal & Peterson, 1999; Fullan & Hargreaves, 1999; Hall & Hord, 2001; O'Day, 2002) and recent empirical literature reviews (e.g., Body, 1992; Duke, 2004; Fink & Stoll, 1998; Marzano, 2003; Spillane, 2002; Weiss, 1995) on the importance of school culture on the adoption process of educational improvement initiatives. The consensus of thinking is that school culture can be both a significant barrier to the implementation of an improvement initiative (Fullan, 2001a; Lieberman & Rosenholtz, 1987; Henshaw, Wilson, & Morefield, 1987) and a means to facilitate the implementation of such initiatives (Deal & Peterson, 1999; Fullan & Hargreaves, 1999; Sternberg, 2000). Additionally, it is theorized that curriculum content may be influenced by school culture (Bruner, 1996; Joseph, Bravmann, Windschitl, Mikel, & Green, 2000).

The work of Romberg and Price (1999) addresses specifically the effects of school culture on curriculum initiatives. Romberg and Price theorize that curriculum initiatives interact with existing school culture in different ways. They propose that initiatives can be placed on a continuum based on the depth to which they challenge existing school cultural values and traditions. At one end of this continuum are what Romberg and Price term *Ameliorative Innovations* (p. 206) which are superficial initiatives aimed at curriculum improvement without altering any existing school values or traditions. The opposite side of the continuum is marked by *Radical Innovations* (p. 206) which directly challenge cultural values and traditions of the school. Romberg and Price recommend that educational leaders identify in advance the aspects of school culture being altered by curriculum initiatives stating, "…curriculum development should be planned with the culture of the school deliberately in mind" (p. 207). Their theoretical framework is consistent with the framework put forth in this study in that it contains a complex interaction of the initiative itself with existing school culture. While teacher's values and beliefs are not mentioned specifically, clearly they are an implied component of what Romberg and Price describe as the school's system of school culture that includes (1) work, (2) knowledge, and (3) professionalism. Moreover, the work presents specific recommendations for school and curriculum leadership to better work with these school cultural factors.

Various empirical studies note both general characteristics of school culture (Corbett et al., 1984; Hargreaves, Earl, Moore, & Manning, 2001; Harris, 2003) and specific elements of the culture such as (1) staff cohesiveness (Heckman, 1987; Louis & Miles, 1990); (2) specific attitudes about student achievement (Cooper, Slavin, & Madden, 1998; Louis & Miles, 1990); and (3) norms of specific interactions (Corbett et al., 1984; Hargreaves, 1994; Little, 1982) influence the implementation of educational initiatives.

In the largest empirical study of its kind at the time, Rutter, Maughan, Mortimore, and Ouston (1979) began to identify in London schools what their contemporaries are now defining as the components of school culture influencing student outcomes. In the five-year longitudinal study involving 20 schools, titled *Fifteen Thousand Hours* – a reference to the amount of time the selected student population spent in school over the duration of the study – Rutter et al. identified what are now important elements of school culture. Their findings suggest that outcomes improve when curriculum ideas and methods of discipline were topics that the school's staff discussed collaboratively. Additionally, Rutter et al. discuss "the importance…of a school-wide set of values and norms of behavior" (p. 192). Clearly these findings can be linked to what Heckman (1987) later described as staff cohesiveness and Little (1982) as norms of collegiality. Interestingly, Rutter et al. clearly state that they had not intended to examine "personal relationships between staff or their satisfaction…or contentment with conditions in the particular school" (p. 193); yet these cultural interactions were found to be of significant value to the study's findings.

In their work with Research for Better Schools, Corbett, Dawson, and Firestone (1984) identified eight school contextual factors that were related to effective change initiatives. In defining *effectiveness*, Corbett et al. describe a teacher's level of implementation using the following characteristics: (1) to what extent classroom practices change; (2) how long the initiative continued in classroom practices; and (3) to what degree the initiative was implemented as intended. Of the eight contextual conditions influencing the effectiveness of change initiatives, five of these conditions address the cultural environment of the district and school. While identifying school ecological factors such as (1) resources, (2) incentives, and (3) organizational structure, the Corbett et al. research concludes that the school cultural influences of (1) existing goals and priorities; (2) staff factions and tension; (3) nature of knowledge use on practices; (4) legacy of prior initiatives; and (5) constituency of school leadership greatly contribute to the successful implementation of improvement initiatives. These findings are significant because they mark the beginning of the evolution of contemporary thinking, which shifts the balance away from ecological factors to the importance of cultural conditions.

Expanding on the work of Corbett et al., Rossman, Corbett, and Firestone (1988) focused specifically on the school cultural aspects of the effectiveness of improvement initiatives identifying important variations in school culture and the effects of that culture on teacher's response to change initiatives. In the conclusions of the five high school case study, they name three broad areas within which school culture tends to fluctuate including (1) variation from a unique "mixture of universal and local norms" (p. 123); (2) variations in the uniformity norms within the school; and (3) variations "in the extent to which staff members perceive them [norms] as alterable" (p. 125). The results of this study indicate that these variations within the aspects of school culture influence the individual teacher's willingness to implement improvement initiatives. It is in this area that these findings are particularly relevant because they are in agreement with the conceptual framework of this study in contending that teacher's attitudes, beliefs, and concerns are a function of the existing school culture and that these individual teacher reactions affect the implementation of the improvement initiatives. Details of this aspect of the Rossman et al. work will be discussed further in the next section of this chapter.

Influence of School Culture on Teacher's Attitudes, Beliefs, and Concerns

In the presentation of his empirical research, Hargreaves (1994) puts forth a grounded theory that addresses specifically the influence of different school cultures on teachers' values and beliefs. Instead of using the term school culture, Hargreaves uses the phrase *culture of teaching* to describe common values, beliefs, and habits; shared norms; and systems of interaction among staff. The theory further breaks down the culture of teaching into two dimensions. The *content* dimension consists of the common values and norms of practice shared by members of the staff. Hargreaves contends that this *content* dimension is greatly influenced by the second dimension, which he describes as the *form* of the culture of teaching. This *form* dimension represents patterns of staff relationships and structures of association in a school. Hargreaves concludes that forms of school culture fall into the five general categories of (1) fragmented individualism, (2) balkanization, (3) collaborative culture, (4) moving mosaic, and (5) contrived collegiality. Figure 7 provides a visual representation of each of Hargreaves' *forms* of school culture.

A culture of *individualism* is characterized by teacher isolation resulting in insulation from outside influences. A *balkanized* culture also is represented by a fragmented whole but teachers demonstrate group loyalties to a particular department, team, grade, or hallway subculture. Both forms – individualism and balkanization – contribute to the schools resistance to change initiatives because of the fragmentation and they lack wholeness in common values and norms. Outside the field of education, this condition is described as a *loosely coupled system*, which is characterized by the slow pace with which initiatives move through the system (e.g., Weick, 1979; Weick, 1982). Hargreaves describes the third form of school culture as *contrived collegiality* where school leadership attempts to force teachers to collaborate through established rules, procedures, and timelines. This form of school culture led to inflexibility and inefficiency in the implementation of reform initiatives. The fourth category – *the moving mosaic* – is represented by overlapping group membership providing flexibility and responsiveness to different situations. While the responsiveness of this form is advantageous, this form of school culture also fosters staff conflicts, uncertainty, and vulnerability. Hargreaves contrasts these patterns of interaction with the fifth form of school culture; what he calls a true *collaborative culture*. This culture is characterized by a uniform set of values centered on sharing, trust and support aimed at continuous improvement with the school.

Hargreaves' grounded theory is significant to this study in that the *form* of school culture influences the *content* of school culture; that is, elements within the school's culture affect the set of common values, beliefs and attitudes held by the teachers working in that culture. The conceptual framework of this study further contends that these common values then contribute to the individual values and beliefs of each teacher in the school.

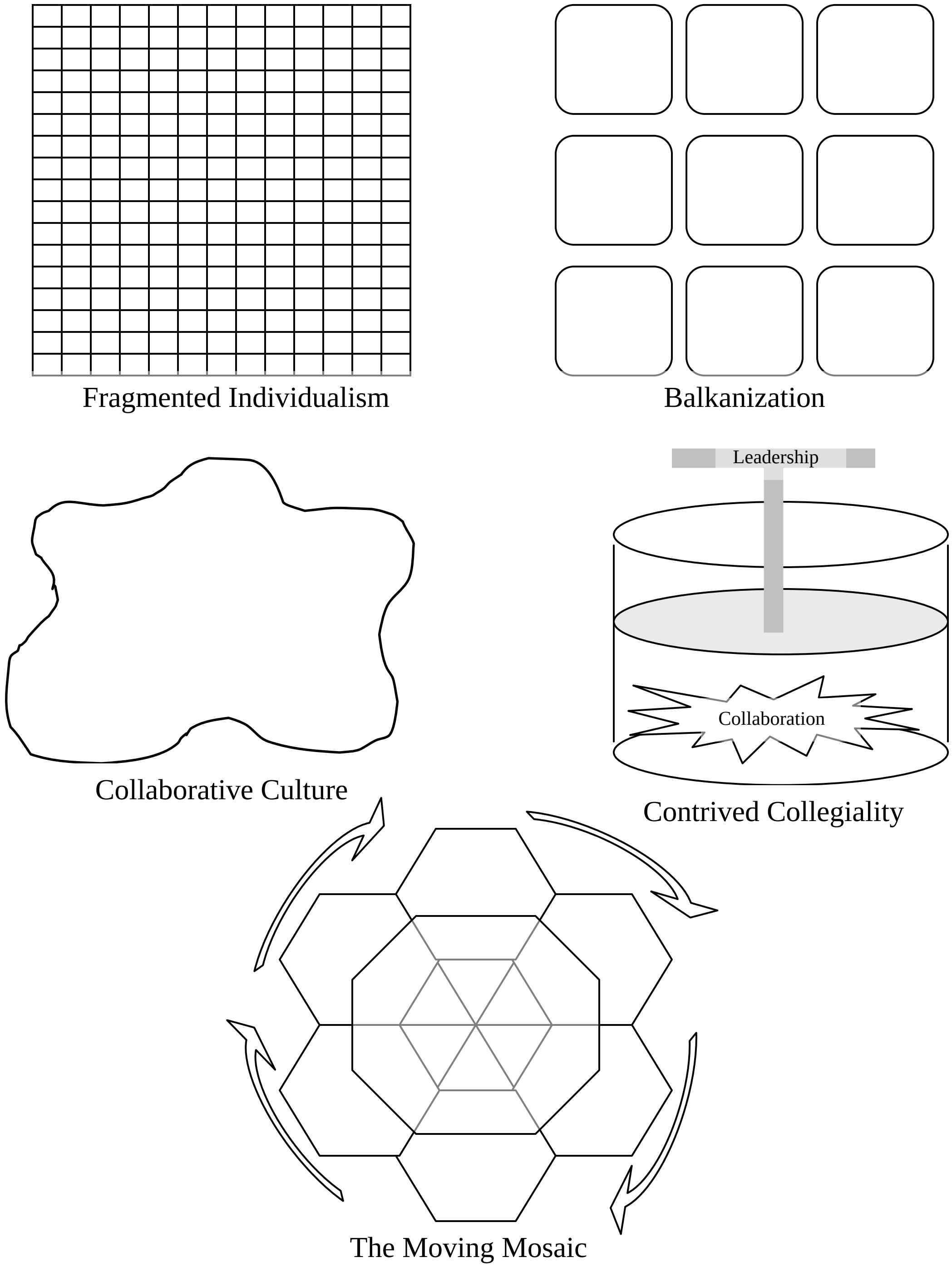


Figure 7. Forms of School Culture

Note. From Changing Teachers, Changing Times (p. 238) by A. Hargreaves, 1994, London: Casell.

It is evident from the body of research that individual school culture – a collective set of values, norms, and relationships – plays a significant role in the following areas: (1) the implementation of improvement initiatives; (2) overall school effectiveness; and (3) teacher's values and beliefs. Evidence of the clarity of these findings can be found in the standards for licensing of school administrators put forth by the Educational Leadership Constituent Council (ELCC) in an effort to provide scaffolding for the training of future educational leaders. The second standard of the ELCC – one of only six – underscores the importance of understanding school culture: "A school administrator is an educational leader who promotes the success of all students by advocating, nurturing, and sustaining a school culture and instructional programs conducive to student learning and staff professional growth" (Wilmore, 2002, p. 32).

It is also clear that school culture is a product of a complex interaction of a number of components with the main contributors being teachers, school leaders, and the particular improvement initiative itself. In the next sections, this review will address each of these components individually as they relate to the implementation of improvement initiatives.

The Individual Teacher: Attitudes, Beliefs, and Concerns

The findings of literature on school culture, particular Rossman (1998), indicate that school culture influences the values and beliefs of individual teachers. In putting forth their principles of implementing change, Hord, Rutherford, Huling-Austin and Hall (1987) state that "change is accomplished by individuals" (p. 8) indicating that the power to implement initiatives lies with the individual classroom teacher. Moreover, Hord et al. indicate, "change is a highly personal experience" (p. 8) alluding to the importance of the individual's values and beliefs related to the change initiatives.

In this section, the review will further focus the discussion, moving away from the school's shared values and norm, to those of the individual teachers (see Figure 8). The review will discuss the literature addressing the influence of individual teacher's attitudes, beliefs, and concerns on their practices and implementation of improvement initiatives. Paralleling the design of this study, specific references to teachers' personal beliefs about curriculum design and delivery will be discussed.

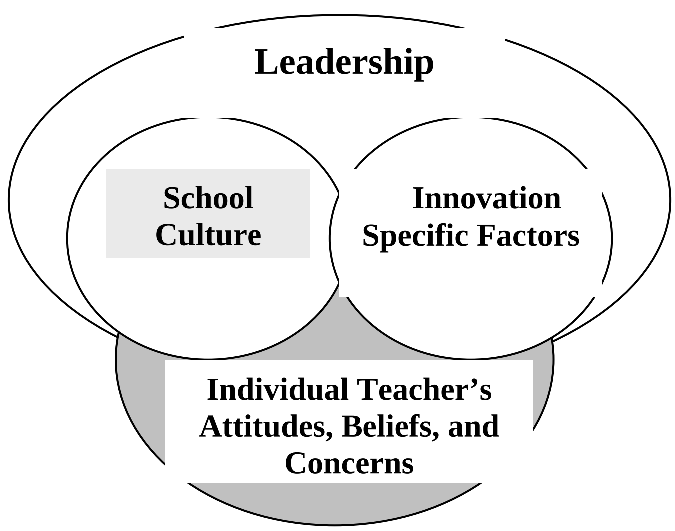


Figure 8. Teachers Influence on the Implementation.

Underpinning the literature on the influence of school culture on educational improvement initiatives is the understanding that these cultures exist because of values, norms and relationships shared by those individuals working in the school. Inherent to this understanding is that school culture influences individual teacher's values and beliefs and reciprocally, these individual values and beliefs influence the larger school culture. Fullan (2001b) concludes after reviewing the relevant literature that, "Both individual teacher characteristics and collective or collegial factors play roles in determining implementation" (p. 83). The complexity and interrelatedness of this interaction is not the focus of this study; instead, the resulting influence of individual teacher's attitudes, beliefs, and concerns on implementation will be the primary aspect addressed by this study. Themes in the literature are clear regarding the influence of teachers on implementation. Based on the school contextual factors – both structurally and culturally – teachers have almost exclusive control of their classroom practices (Fullan & Hargreaves, 1999; Hall & Hord, 2001; Lodge & Reed, 2003; Mclaughlin, 1998; O'Day, 2002; Reeves, 2002; Spillane & Seashore Louis, 2002). The decisions on classroom practice are to a large degree influenced by the individual teacher's values and beliefs about instruction, learning, themselves, and their students' needs.

After reviewing the literature on educational improvement initiatives, Hawley (1978) concludes, "the crucial determinant on any given innovation's success is the willingness of teachers to employ it and do so creatively and selectively in the context of the needs and abilities of their students" (p. 229). Though over 25 years old, Hawley's conclusions still characterize the current issues on educational improvement initiatives today. It is Hawley's element of *teacher willingness to implement* which has received greater attention in recent years and is a component of this study.

While the conceptual literature on educational improvement has a broad scope, this review will limit its discussion to those significant works that address the importance of teachers and their values and beliefs in the adoption process. In 1971, Sarason pointed to the lack of understanding of teacher's values and beliefs as a major cause of the failure of educational reform initiatives stating that one of the reasons for initiative failure "is the tendency for change proposals to emanate from…high without taking into account the *feelings and opinions* [italics added] of those who must implement the change, i.e., the teachers" (p. 221). Sarason's thinking is further supported by the contemporary works of Kanter (1988), Rogers (1995), and Senge (1990) in the study of innovation outside the field of education. Specifically, Rogers points to the realm of individual control in the adoption process by classifying people into *adopter categories* of (1) innovator, (2) early adopter, (3) early majority, (4) late majority, and (5) laggards. Figure 9 depicts the adopter categories within the normal distribution curve.

Rogers' theory contends that this bell-shaped distribution of adopter types is relatively consistent within different organizations implying that implementation of new initiatives will mirror the normal distribution of traits found in any population based on standard deviations from the mean implementation time. In addition to indicating the importance of the individual's decisions in the adoption process, Rogers believes that these decisions are not based on the objective merits of the innovation but instead on what he calls "near-peer's experiences" (p. 36). To state simply, an individual's decision to implement an initiative is based on a complex interaction of one's innovator type and the values and beliefs about the initiative formed in communication with others who have implemented it.

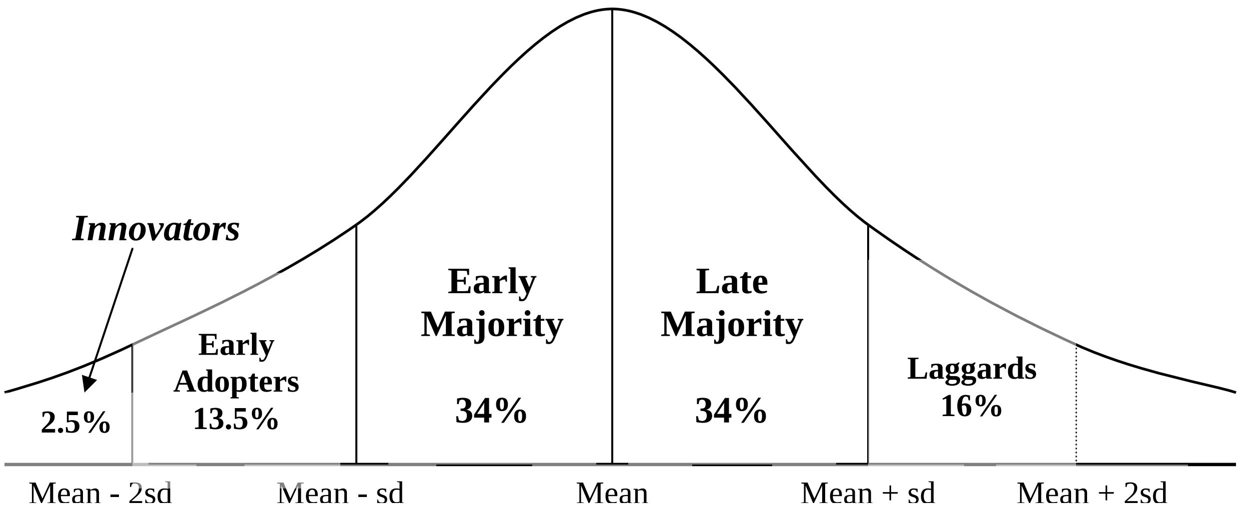


Figure 9. Normal Distribution of Adopter Categories

Note. From *Diffusion of Innovation* (p. 262) by E. M. Rogers, 1995, New York: The Free Press. Copyright 1995 by Everett M. Rogers. Copyright 1962, 1971, 1983 by The Free Press, a Division of Simon & Schuster Adult Publishing Group. Reprinted with Permission of the publisher. All rights reserved.

Senge's work also points to the importance of the individual's values and beliefs in the adoption process. In numerating his *Five Disciplines,* Senge describes one of them as *Making Mental Models*. Senge (2000) contends that people evaluate situations and make decisions based on their own mental model compiled from preexisting values, beliefs, and experiences. These models distort one's objective views of an initiative in that "people are drawn to take in and remember only the information that reinforces their existing mental model" (p. 67) thereby impeding their willingness to change. Senge's point underscores the significant influence of an individual's values and beliefs on their decision to implement a change initiative.

It is interesting to note that much of the literature on implementation identifies the teacher as the ultimate determining factor in the adoption process (e.g., Fullan & Hargreaves, 1999; Hall & Hord, 2001; Lodge & Reed, 2003; Mclaughlin, 1998; O'Day, 2002; Reeves, 2002; Spillane & Seashore Louis, 2002). Fullan (2001a) synthesized the works of others in his statement, "All innovations worth their salt call upon people to question and in some respect to change their behavior and their beliefs" (p. 40). Fullan described what he calls *the implementation dip* as a decrease in performance and confidence during the adoption process. Fullan theorizes that the *implementation dip* is a result of the combination of (1) technical issues revolving around skills and knowledge about the initiative and (2) social-psychological factors related to the fear of change. It is this second component that is central to this study by pointing to the importance of individual teacher's attitudes, beliefs, and concerns on implementation.

Synthesizing empirical work on the idea, Hall and Hord (2001) present an implementation continuum depicting the drop in the performance related to teacher's values and beliefs. (See Figure 10) Overlaying teacher's Stages of Concern, part of their Concerns Based Adoption Model, Hall and Hord contend that teachers will progress through a predictable sequence of stages during the adoption process of educational initiatives. These stages are determined by a teacher's attitudes and concerns about the particular initiative. The *Stages of Concern* are broken down into broad categories: (1) concerns for how the initiative will affect them personally; (2) concerns about how to manage the initiative's requirements; and (3) concerns about the impact of the changes on students (Hall & Hord, 2001). Moreover, these stages are in part an indicator of their personal progression during the adoption process indicating the degree to which classroom practices have changed to match the initiative's goals. The *Stages of Concern* was used as a framework to interpret teacher's attitudes, beliefs, and concerns and will be discussed in the methodology chapter of this document.

The Concerns Based Adoption Model (CBAM) is a perennial theory in the study of the change process emphasizing the importance of the individual during the implementation phase (Hall & Hord, 1987). CBAM and the Stages of Concern will be discussed in detail in the leadership section of this chapter and then again in chapter three.

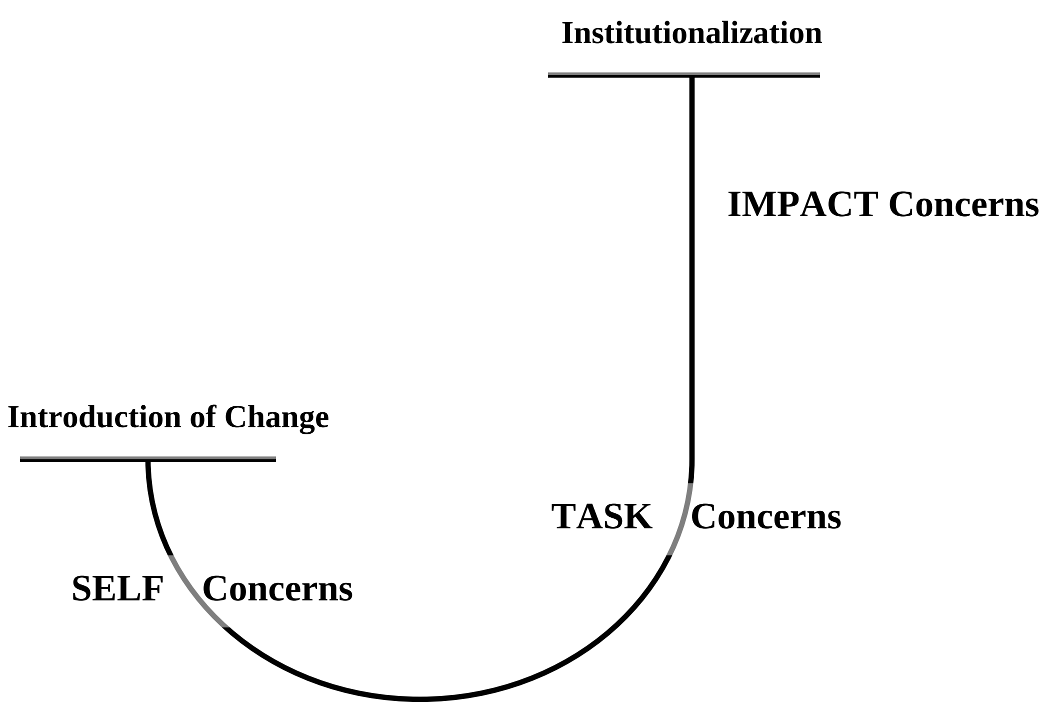


Figure 10. Teacher's Stages of Concern in relation to the Implementation Dip

Note. From *Implementing Change: Patterns, Principles and Potholes* (p. 193) by G.E. Hall and S.M. Hord, 2001, Boston: Allyn and Bacon. Copyright 2001 by Pearson Education. Reprinted with Permission of the publisher.

There are indications that teachers' values and beliefs not only influence their practices but may also influence their curricular decisions. In his 1996 work, *The Culture of Education*, Bruner states that curriculum itself "is influenced by folk pedagogies that are composed of incoherent, deeply embedded beliefs about what is normal" (p. 162). Bruner proposes a direct link between individual teacher's values and beliefs and the design, adaptation and delivery of curriculum. If this relationship exists, district curriculum initiatives grounded in a mandated test-driven accountability environment may meet considerable resistance if they are not aligned with teacher's beliefs about pedagogy. Bruner continues identifying the need for further research in this area by stating, "these conditions generally are left unexamined" (p. 162). More recently, Romberg and Price (1999) in discussing new curriculum's interaction with existing school values allude to the importance of the individual teacher's perceptions. Similar to Bruner, they conclude that curriculum initiatives may conflict with a teacher's system of "beliefs, hopes, desires, and interests" (p. 20).

The empirical literature on what influences teacher's values and beliefs and how these values and beliefs affect classroom practices began in the 1960's with simple exploration into what it was like to be a teacher and work in a school. In 1975, Lortie published his seminal work *Schoolteacher*, a sociological investigation involving the compilation of interviews from major east coast metropolitan areas in the 1960's. While the findings are broad, addressing such aspects as why one becomes a teacher, sentiments and interpersonal preferences, Lortie identifies particular contextual characteristics of teaching that are unique to the profession. He states, "The teacher's craft ... is marked by the absence of concrete models for emulation, unclear lines of influences, multiple and controversial criteria, ambiguity about assessment timing, and instability in the product" (p. 136). Lortie concludes that these conditions exist in part because of the unique characteristics of (1) working with adolescents, (2) working with students who are mostly involuntary participants, and (3) the dominance on group focus as opposed to individual relationship.

Other studies also confirm the themes of uncertainty and isolation as a foundation in the formation of teacher's values and beliefs (Goodlad, 1984; Rosenholtz, 1991). In the seminal work, *Teacher's Workplace*, Rosenholtz (1991) identified two recurring themes in the nature of a teacher's work. In the mostly quantitative analysis, Rosenholtz found a similar theme of teaching uncertainties marked by unclear technique and unpredictable outcomes. Moreover, the study refines Lortie's description of *unclear and ambiguous* to include specific references to what Rosenholtz called a theme of *threatened self-esteem* causing teachers to have the predominant disposition of making decisions based on their ability to maintain control in the classroom.

Lortie and Rosenholtz also identified similar motivations behind teachers' actions and classroom decision-making process. Lortie reveals that teachers are significantly motivated by psychic rewards such as a successful experience with one particular group of students or making a difference in the life of an individual student. Rosenholtz echoes the same theme, identifying teachers' commitment to student achievement as a determining factor in classroom decision-making. Rosenholtz concludes that teachers "balk at" (p. 162) policies that do not help students.

Given the uniqueness and strength of teacher's values and beliefs about their work, it is important to discuss how these factors may influence their practices. A number of studies point to the power and control teachers have over classroom instruction practice (Fairman & Firestone, 2001; Harris, 2003; Ingersoll, 2003; Kennedy, 2004; McLaughlin, Talbert, & Bascia, 1990; Weiss, 1995; Wilson & Floden, 2001).

In discussing the interplay between teacher isolation and teacher autonomy, Goodlad (1984) found teachers perceive that they have the most influence in the areas of curriculum, instruction, and pupil behavior. Moreover, the study points to the strength of this control by quantifying “approximately two-thirds of the teachers at all levels perceived that they had ‘complete’ control over teaching techniques and students’ learning activities” (p. 189). In similar quantitative findings, Ingersoll (2003) concludes teachers have major influence over the selection of “classroom concepts taught” and “classroom teaching techniques” (p.76).

The breadth of this control over classroom instructional practice is significant because of the influence of teacher’s values and beliefs on the decision-making process related to the implementation of curriculum initiatives. Returning to the work of Rossman, Corbett, and Firestone (1988), their study identified variations within school cultures and the influence of these variations on teacher’s values and beliefs. Specifically, the findings “depict how culture tempers a staff’s reactions to change and its acceptance of new expectations” (p. 126). Rossman et al. discuss an individual’s aversion to change as a function of the time since the adoption of the initiative and the particular value or belief being affected by that initiative. They distinguish between the ideas of simple resistance to change and “an emotional, deeply felt reaction” (p. 126) described as aversion to change. The notion of aversion, as opposed to simple resistance, underscores the strength of teacher’s values and beliefs identified by Lortie (1975) and

Rosenholtz (1991). This strong emotional disagreement with reform initiatives can also be linked to initiative failures (Hargreaves, 1998; Kennedy, 2004; Rodriguez, 2000). Additionally, by alluding to aversion as a function of time, Rossman provides empirical support for Fullan's (2001a) implementation dip and Hall and Hord's (2001) Stages of Concern continuum.

Of particular interest, because of its similarities to this study, is the recent work of Fairman and Firestone (2001) out of Rutgers University in New Jersey. The study explored the district's role in implementing the curriculum initiatives in the context of a test-driven accountability environment in Maryland and Maine. Specifically, Fairman and Firestone examined the change in teachers' classroom practices as a result of district curriculum initiatives. Their investigation is remarkably similar to this study in that the societal and political contexts are the same; the initiative under investigation involves a state-mandated standards-based mathematics curriculum reform; and the unit of focus is the individual classroom teacher. Through qualitative observations, their findings parallel the premise in this study that teacher's individual values and beliefs greatly influence their classroom practices. In discussing the "strong relationship" (p. 141) between values and pedagogical practices, Fairman and Firestone state, "We suggest that teachers' own beliefs about mathematics and student learning were a more important factor shaping teachers' choice of instructional strategies and goals for mathematics lessons (p. 138). Their findings imply, as does the contention of this study, that individual teacher's attitudes, beliefs, and concerns play a central role in the implementation of curriculum initiatives.

This study seeks to expand on Fairman and Firestone's findings by linking student achievement on state assessments to individual teacher's attitudes, beliefs, and concerns. Fairman and Firestone identify a lack of exploration and understanding of the implementation of "centrally-mandated reform" (p. 124). While their study documents the difficulty of influencing classroom pedagogy, it leaves unexamined the specific individual teacher's values and beliefs behind the implementation difficulties. This study seeks to further explore these issues while linking student achievement to the contextual factors of leadership and school culture along with teacher's attitudes, beliefs, and concerns.

In their study examining how teachers change to implement reform curriculum, Hargreaves, Earl, Moore, and Manning (2001) conclude the process of change consists of two distinct components: (1) Intellectual Work involving knowledge, skills and behaviors; and (2) Emotional Work involving relationships, goals and beliefs. Harris (2003) concurs with these findings by stating, "Change in the classroom …involves much more than acquiring new skills and knowledge. It essentially means changing attitudes, beliefs, and personal theories in order to reconstruct a personal approach to teaching" (p. 378). In Elmore's (2000) words, "…because of loosely coupled structures...innovation is a 'volunteer activity' highly correlated with the personal values and predispositions of individual teachers" (p. 7). This study seeks to explore this personal, emotional component of the implementation of curriculum initiatives.

The existing literature presents a clear picture of the implementation process and obstacles within that process. The relationship between school culture, teacher's values and beliefs, and their classroom practices is well documented. Weiss (1995) summarizes the connection between school culture and teacher's values and beliefs in stating, "Institutions… shape what teachers believe in, what they want, and what they know and bring to bear on decisions" (p. 587). Furthermore, the literature plainly indicates that these individual values and beliefs play a determining role in the implementation of new classroom practices. It is this interaction – between teacher's values, their classroom practices, and student achievement – this study sought to explore in the context of a test-driven accountability environment.

Test-Driven Accountability

Hord et al. (1987) state the focus of implementation plans "should be on the individual, the innovations, and context" (p. 6). This review has thus far established the importance of two of the three components of the statement. To summarize, the context - school culture - and the individual – the teacher - play a critical role in the implementation of an initiative. The third element of this complex environment affecting implementation involves factors attributed to the innovation itself (see Figure 11). In this case, the initiative under investigation is a federally mandated test-driven accountability system in the form of NCLB. This section will address the literature on how the adoption of high stakes testing programs influences school culture and teachers' attitudes, beliefs, and concerns about curriculum initiatives as a result of the adoption of these programs. The interaction of these elements – school culture and teacher's attitudes, beliefs, and concerns - plays a significant role in the implementation of curriculum initiatives.

The topic of test-driven accountability for schools, teachers, and students is not new. Individual states began instituting various systems of accountability in public education as early as the 1980’s. However, with the passage of the NCLB legislation in January of 2002, the discussion regarding a federally mandated test-driven accountability system has escalated dramatically. As the stakes increase, the literature both in support (e.g., Bush, 2001; Page, 2001) and in opposition (e.g., Bracey, 2003c; Kohn, 2004; Ohanian, 2001) of NCLB has become more emotionally charged. Much of the literature is ideologically based and politically motivated. Moreover, there appears to be a substantial volume of “empirical” research that is also politically funded. As a result, this section does not attempt to discuss the merits of NCLB or other test-driven accountability systems but instead addresses teachers’ perceptions of these mechanisms. These perceptions influence their individual values and beliefs and the greater school culture, which in turn influences classroom practices and their decision to implement the initiatives. Additionally, the synthesis has incorporated a number of smaller research studies and doctoral dissertations in an attempt to filter potential biases as the review discusses some anticipated and unanticipated outcomes of high-stakes testing and the resulting influences of teachers’ perceptions of the innovation.

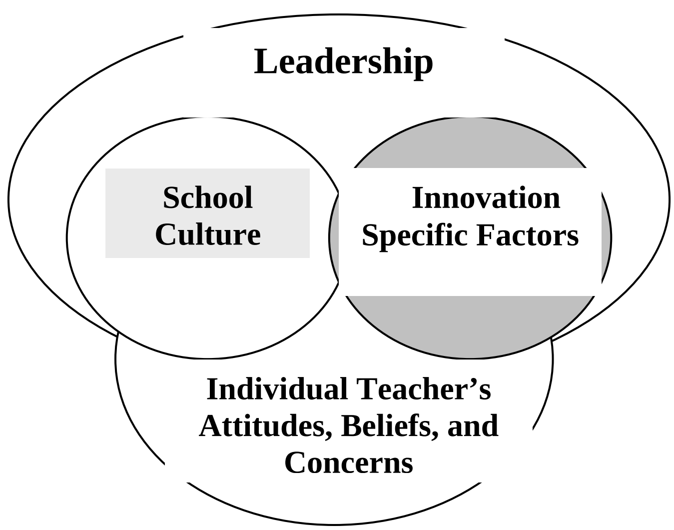


Figure 11. Test-Driven Accountability’s Influence on Implementation.

In general, the recent literature on test-driven accountability systems points to a consistent set of consequences from the innovation. While some of these consequences are intended, representing an improvement in the educational environment, the majority of the documented outcomes of school accountability systems can be attributed as unintended and as having a negative impact on a variety of facets of education. Moreover, the literature clearly illustrates that teachers have strong feelings about the test-driven accountability system under which they work.

As stated previously, much of the recent literature is suspect due to any number of political and ideological biases. For this reason, the review will only discuss the work of Madaus (1999) because of its relevance to the variables in this study. In 1999, prior to the passage of NCLB, Madaus' work *The Influence of Testing on the Curriculum* identifies seven general principles governing the influence of testing on curriculum, teaching, and learning (see Table 2). The set of principles in their entirety illustrates the profound influence of mandated testing on teachers' classroom practices, curriculum decisions, the set of shared values and norms in the school. Madaus concludes, without empirical support, that test-driven accountability affects (1) school administrative practices, (2) school organization, (3) teachers, and (4) students. Each of these components plays a key role in influencing school culture and teacher's values and beliefs.

The vast majority of empirical literature on test-driven accountability systems documents individuals' perceptions of the influences of the system on the educational environment. Prior to discussing this literature on teachers' perceptions of test-driven accountability systems, the influences on their perception must first be examined. The literature identifies both quantitatively and qualitatively a number of unanticipated outcomes of the introduction of a test-driven accountability system in the educational environment. These outcomes play a significant role in how individual teachers judge the system and perceive the initiative associated with it. A number of smaller recent studies have identified a variety of unforeseen problems with other test-driven accountability systems that may influence the teacher’s values and beliefs about the initiative in this study. While these studies used small samples and at times unclear research designs which limit their validity, they contribute to the growing body of research identifying outcomes of test-driven accountability such as the potential of adverse effects on rural communities (Hodges, 2002) and English language learners (Munoz, 2002; Pedroza, 1998); potential racial and economic inequities (Johnson, Boyden, & Pittz, 2001; Lindsey & Fillippino, 2002; McNeil & Valenzuela, 2000; Valenzuela, 2000); increase in high school drop out rates (Amrein & Berliner, 2002a; Madaus & Clarke, 2001; Valenzuela, 2000); and a shift of classroom instruction back to a more teacher-directed approach (Passman, 2000). Additionally, support exist for other inappropriate methods of improving scores such as (1) low performing students being retained in the year prior to testing; (2) low performing students being suspended during testing days; (3) the withholding of educational opportunities like art, music and physical educations; and (4) cheating supported by school personnel (Amrein & Berliner, 2002a).

Table 2

General Principles: Influences of Testing on Curriculum, Teaching, and Learning

Principle 1	The power of tests and examinations to affect individuals, institutions, curriculum, or instruction is a perceptual phenomenon: if students, teachers, or administrators believe that the results of an examination are important, it matters very little whether this is really true or false – the effect is produced by what individuals perceive to be the case
Principle 2	The more any quantitative social indicator is used for social decision-making, the more likely it will be to distort and corrupt the social processes it is intended to monitor.
Principle 3	If important decisions are presumed to be related to test results, then teachers will teach to the test.
Principle 4	In every setting where a high-stakes test operates, a tradition of past exams develops, which eventually de facto defines the curriculum.
Principle 5	Teachers pay particular attention to the form of the questions on a high-stakes test and adjust their instruction accordingly.
Principle 6	When test results are the sole or even partial arbiter of future educational or life choices, society tends to treat test results as the major goal of schooling rather than as a useful but fallible indicator of achievement.
Principle 7	A high-stakes test transfers control over the curriculum to the agency which sets or controls the exam

Note. Compiled from *The Influence of Testing on the Curriculum* (pp. 73 - 87) by G. F. Madaus, 1999. In M. J. Early & K. J. Rehage (Eds.), Issues in Curriculum (pp. 73 – 111). Chicago: University of Chicago Press.

Another notable unanticipated outcome of test-driven accountability systems revolves around the validity of what the tests measure. In a recent comprehensive analysis of test scores in 18 states, Amrien and Berliner (2002c) identified inconsistencies between improvements on tests linked to accountability and various other national recognized measures of student performance. Over half of the states that require high-stakes high school graduation exams demonstrated decreases in scores on the American

College Test (ACT), Advanced Placement (AP) exam, and the Scholastic Aptitude Test (SAT). Amrein and Berliner also found no pattern of improvement in the National Assessment of Education Progress (NAEP). Additionally, they documented a decrease in NAEP scores involving the cohort data between fourth and eighth grade in over half the states examined.

> If we assume that the ACT, SAT, NAEP and AP tests are reasonable measures of the domain that a state's high-stakes testing program is intended to affect, then we have little evidence at the present time that such programs work. Although states may demonstrate increases in scores on their own high-stakes tests, transfer of learning is not a typical outcome of their high-stakes testing policy. (Amrein & Berliner, 2002c, p. 52)

While the intention of this study is to inform policymakers in the area of educational reform, the findings contribute to teacher's perceptions of initiatives designed to meet the demands of such test-driven accountability systems. These questions raise important concerns in the minds of classroom teachers alluding back to Madaus' (1999) first principle of testing (see Table 2). "If students, teachers, or administrators believe that the results of an examination are important [or unimportant]…the effect is produced by what individuals perceive to be the case" (Madaus, 1999, p. 78). In this case, the *effect* is the individual teacher's decision to implement district curriculum initiatives, which in turn, influences their individual values and beliefs about the initiative.

Previously, this review discussed the critical role that teachers play in determining whether an educational initiative succeeds or fails. Moreover, there exists a clear connection between teacher's values and beliefs about the initiative and their classroom practice. A substantial amount of recent literature exists on the teachers' perceptions, observations, and concerns regarding the mandate of test-driven accountability systems. There are a limited number of positive perceptions about mandatory testing such as establishing clearer instructional goals (Jones & Egley, 2004; Shepard & Dougherty, 1991) and higher expectations for learning (Jones & Egley, 2004). Most positive aspects are outweighed by the perceived negative aspects (Shepard & Dougherty, 1991). Teachers identified great pressure to improve student performance on high-stakes tests (Clarke, Shore, Rhoades, Abrams, Miao, & Li, 2003; Jones & Egley, 2004; Mabry, Poole, Redmond, Schultz, 2003; Moore, 1994; Pedulla, Abrams, Madaus, Russell, Ramos, and Miao, 2003; Shepard & Dougherty, 1991; Wright, 2002) along with what they describe as disempowerment of their professional responsibilities (Barksdale-Ladd & Thomas, 2000; Wright, 2002). In a 47 state, 12,000 teacher sample, Pedulla, Abrams, Madaus, Russell, Ramos, and Miao (2003) found over 80 percent of teachers indicated experiencing pressure from building and district administrators to improve test scores. A potential result of these pressures is teachers' perceptions that they are spending more classroom time teaching test-taking skills (Barksdale-Ladd & Thomas, 2002; Moore, 1994; Jones & Egley, 2004; Pedulla et al., 2003; Shepard & Dougherty, 1991). Teachers also perceived test-driven accountability systems having a major effect on curriculum in their schools, particularly the narrowing of content to address only those skills on the standardized tests (Barksdale-Lad & Thomas, 2000; Clarke et al., 2003; Mabry et al., 2003; Moore, 1994; Pedulla, 2003; Shepard & Dougherty, 1991; Wright, 2002). In their quantitative analysis, Pedulla et al. found 75 percent of teachers in their study agreed with the statement, "The state mandated testing program leads some teachers in my school to teach in ways that contradict their own ideas of good educational practices" (p. 43). This contradiction between teacher's values and beliefs and the teaching practices required by high stakes testing initiatives influences their decision to implement such practices.

There is also evidence from teachers themselves that they perceive an increase in inappropriate testing practices including cheating as a result of the pressure to improve scores (Moore, 1994; Shepard & Dougherty, 1991). Results from a number of studies also indicate that teachers have concerns as to how the testing results are used by the media and government officials to compare students and schools (Clarke et al., 2003; Jones & Egley, 2004; Shepard & Dougherty, 1991)

Overall, teachers perceive test-driven accountability systems to be unfair, particularly to those students with special needs (Clarke, et al., 2003; Mabry et al. 2003; Wright, 2002). In addition, teachers do not perceive these initiatives to be improving student learning but instead shifting the focus away from a meaningful constructivist-learning environment to less creative teacher-centered classrooms (Jones & Egley, 2004; Moore, 1994; Pedulla et al., 2003). After surveying 700 elementary teachers about Florida's test-driven accountability system, Jones and Egley (2004) found that nearly 80 percent of teachers believe that Florida's initiative "was *not* taking Florida's public schools in the right direction (p. 7). Pedulla et al. found similar perceptions in their national sample finding only 50 percent of teachers agreeing with the statement, "The state-mandated tests measure high standards of achievement" (p. 40). Moreover, Pedulla et al. and Abrams (2002) found the vast majority of teachers do not believe that systems of test-driven accountability are worth the investment of human and financial resources.

Given its recent adoption, the research on the true effects of NCLB is still incomplete. Whether a national test-driven accountability system can lead to authentic improvement in student learning requires further scholarly investigation. Yet it is also clear that given the lack of valid, reliable, and triangulated measures of student achievement to judge this system of test-driven accountability, the perception of the initiative's merits lead the debate. After synthesizing qualitative data interviews, quantitative document analysis and his personal observations, Wright (2002) concludes that the results "…provide compelling evidence that there are serious flaws in using high-stakes tests to improve school performance" (¶ 160). It is these perceptions of the initiatives that interact with both school culture and individual teacher's values and beliefs to form the complex implementation environment through which the initiatives associated with the test-driven accountability system must navigate if they are to reach the point of institutionalization. The next section of this review will address the important role of leadership in facilitating the navigation of educational initiatives through the complex school environment.

Leadership

Given the importance of school culture; individual teacher's attitudes, beliefs, and concerns; and factors related to the test-driven accountability systems on the implementation of curriculum initiatives, the following section will address the remaining element of the school environment influencing the adoption process (see Figure 12). Leadership and curriculum support factors play a significant role in the implementation of initiatives as leadership directly influences school culture and teacher's attitudes, beliefs, and concerns. Hord et al. (1987) contend that the “focus of the [initiative] facilitator should be on the individual, the innovation and the context” (p. 6). The literature on educational leadership is extremely vast. This section will focus on leadership factors that influence school culture; teacher’s attitude, beliefs, and concerns; and the implementation of initiatives.

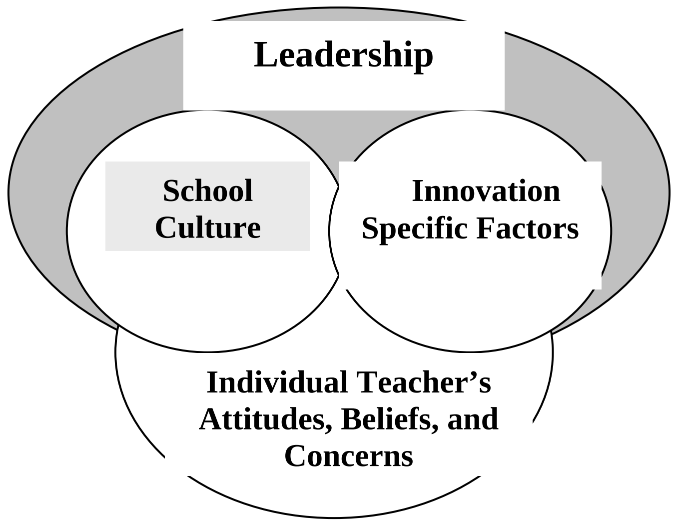


Figure 12. Leadership and Curriculum Support’s Influence on Implementation.

A consistent theme throughout the literature on the failure of educational improvement initiatives is a lack of leadership. School leadership can both help and hinder the implementation of improvement initiatives, as it is believed that educational leaders – particularly at the school level – have the ability to control the school’s culture and influence individual teacher’s attitudes, beliefs, and concerns about the specific initiative (Blasé, 1998). This control is based on the leader’s ability to communicate and build common attitudes, beliefs, values, and norms among the school’s staff. Hargreaves et al. (2001) state, “Significant school wide change is impossible without effective school leadership” (p. 175) identifying the “lack of continuity in or inconsistency of exceptional school leadership" (p. 159) as a barrier to implementation. Moreover, a body of literature points to distributed – less authoritative, more democratic – leadership styles as facilitating the implementation of educational initiatives.

The importance of leadership on the implementation of initiatives can be identified throughout the literature. Discussing innovations outside the field of education, Kanter (1988) points to the importance of building a coalition to facilitate the initiative during the adoption process identifying the importance of "backers, supporters, sponsors, and friends in high places" (p. 184). Rogers (1995) refines Kanter's idea describing the interaction between change agents and opinion leaders. "A change agent is an individual who influences clients' innovation-decisions in the direction deemed desirable by a change agency" (p. 335). Opinion leaders are individuals who are able to influence the attitude and behaviors of others within an organization. In the educational environment, these change agents range from district level administrators and building principals to curriculum support staff. The opinion leaders in the school environment are the individual teachers who have a greater degree of influence over the behavior of other teachers in the building. The ideas of both Kanter and Rogers parallel this study as it seeks to explore the effects of building level administrative and curriculum support as it relates to teacher's attitudes, beliefs, and concerns about the test-driven accountability.

A number of leadership models exist in the field of education describing characteristics of leaders aimed at facilitating the implementation of educational initiatives (e.g., Crow, Hausman, & Scribner, 2002; Dufour; 2003; Fullan, 2001a; Elmore, 2000; Evans,1993; Hall & Hord, 2001; Reeves, 2002). Each of these authors addresses the need for educational leaders to focus on establishing a school culture conducive to improvement and maintaining lines of communication with teachers. Elmore (2000) describes what he calls *distributed leadership* based on individual competencies, interests, skills, and dispositions. In a later work addressing the specific societal context surrounding this proposed study, Elmore (2003) explains, “Powerful leadership is distributed because the work of instructional improvement is distributed;” that is, “distributed expertise leads to distributed leadership” (p. 5). In discussing leadership that promotes professional learning cultures, Dufour (2003) conceptualizes a similar style. He uses the term *loose-tight leadership* to describe what he calls a *directed autonomy,* school working environment. Focusing on the importance of the individual school and teacher in the adoption process, Dufour urges school leaders to implement “strategies that establish a clear priority and discernible parameters and then provide each school and department with the autonomy to chart its own course for achieving the objectives” (p. 2).

The goal of these leadership characteristics link directly back to establishing the elements of a positive school culture, named staff cohesiveness (Heckman, 1987) and norms of collegiality (Little, 1982), which are conducive to the implementation of an initiative. Crow, Hausman, and Scribner (2002) theorize that leadership can influence the school culture and individual teacher’s attitudes, beliefs, and concerns by (1) fixing strained relationships between groups; (2) openly addressing conflict; and (3) decision-making based on consensus. Their summary not only stresses these relationship issues in the implementation of initiatives but also incorporates the ideas of Elmore and Dufour:

> …school cultures that associate leadership with formal positions, and “followership” with those who are not in formal leadership positions, will

> be unable to innovate quickly enough to thrive in their environment. It is therefore imperative that principals adopt a "broader conception of school leadership, one that shifts from a single person, role-oriented view to a view of leadership as an organizational property shared among administrator, teachers and perhaps others (Smylie & Hart, 2000, p. 428)." (Crow, et al., 2002, p. 201)

In his seminal work, *Leading in a Culture of Change,* Fullan (2001a) outlines a framework for educational leadership designed to establish commitment to a system of shared values, beliefs, and norms aimed at improvement stating that "leadership style affects climate and, in turn, performance" (p. 35). Fullan alludes to the importance of both school culture and individual teacher's attitudes, beliefs, and concerns in stating, "The litmus test of all leadership is whether it mobilizes people's commitment to putting the energy into actions designed to improve things. It is individual commitment, but it is above all collective commitment" (p. 9). To establish this needed commitment, he puts forth a framework surrounded by the leader's personal energy, enthusiasm, and hopefulness incorporating the components of (1) moral purpose; (2) understanding the change process; (3) relationships; (4) knowledge creation and sharing; and (5) coherence making. (see Figure 13) Each of these components aims to stimulate and sustain a system of shared values, beliefs, and norms to develop a school environment of professional learning and distributed leadership.

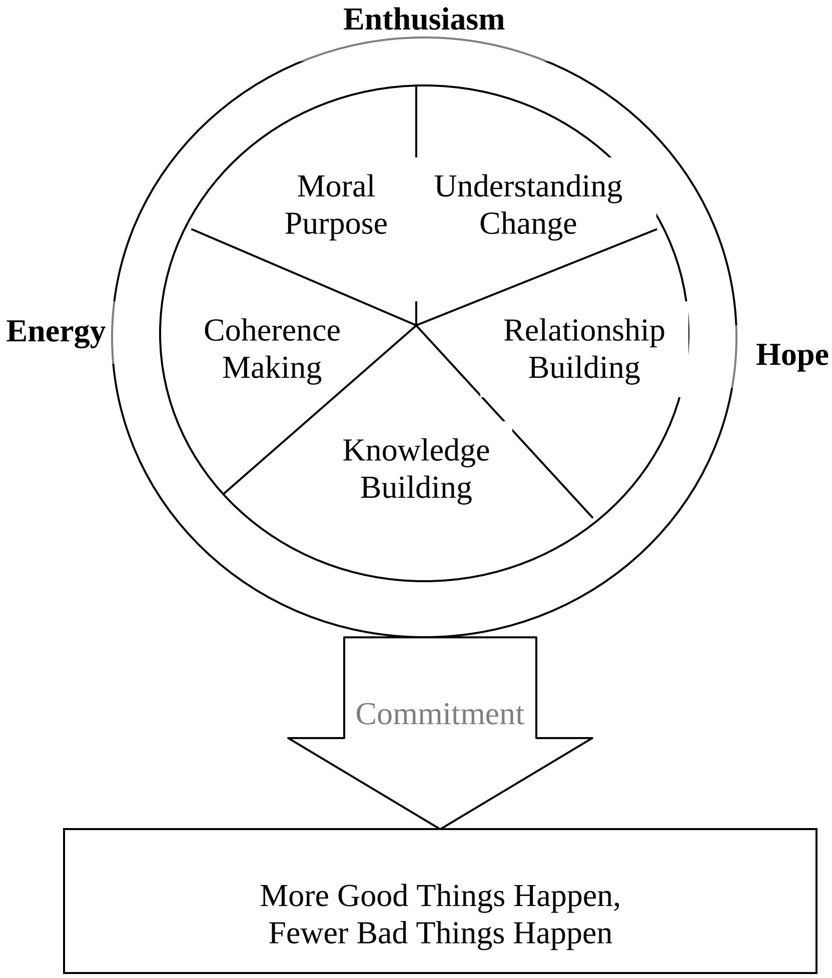


Figure 13. Fullan's Leadership Framework for Change.

Note. From *Leading in a Culture of Change* (p. 4) by M. Fullan, 2001, San Francisco : Jossey-Bass.

The question remains; what effects do leadership and support factors have on school culture and teacher's attitudes, beliefs, and concerns about district initiatives. Empirically, the literature on leadership and educational improvement is vast. A number of earlier studies specifically examined leadership's role in the implementation process of educational initiatives. These studies served as both empirical validation and foundation for much of the aforementioned conceptual work. These studies established the importance of (1) leadership characteristics to promote a school culture that is more conducive to implementation (Heckman, 1987; Hord & Hall, 1986); (2) leadership in the implementation phase (Hall, 1988; Hargreaves et al., 2001; McLaughlin, 1991) and (3) classroom support during the implementation phase (Dimock-Boyd & McGree, 1995; Hall, Alquist, Hendrickson, George, Johnson, Thornton, & Uchiyama, 1999). These findings are significant in that they stand in support of the conceptual framework of this study, which contends that leadership impacts implementation through its influences on school cultures and teacher's attitudes, beliefs, and concerns.

Turning to the literature addressing the initiatives under investigation in this study, a more recent qualitative investigation involving Department of Defense schools adopting a K-8 math curriculum initiative, Johnson (2000) identifies both the importance of building leadership support and curriculum content support in changing teacher's classroom practices. Similarly, Hall, Alquist, Hendrickson, George, Johnson, Thornton, and Uchiyama (1999) examined how teachers should be supported to facilitate a change in classroom practice while implementing math curriculum initiatives. They conclude that institutionalization is a function of (1) strong strategic leadership, (2) skilled change facilitators, (3) a worthwhile innovation, and (4) time. Specifically addressing leadership and support, Hall et al state "without extensive district-wide and classroom level support many teachers will demonstrate only short term mechanical use [of an initiative] if any at all" (p. 5). Interestingly, the findings allude to *worthiness of innovation* and *time* as additional keys to success, implying that these two conditions are largely out of the immediate control of school leadership. Both the Hall et al. and Johnson studies are particularly relevant because the innovation under investigation involved top-down mathematics reform initiatives similar to the district initiatives being addressed in this study. Extending their work, this study explored a similar context with the addition of a test-driven accountability system to the complex interaction of leadership and support; and school culture and teacher's attitudes, beliefs, and concerns.

Over the past 30 years, Hall and various colleagues have conducted and compiled empirical research on the implementation phase of the adoption process (e.g., Hall & Hord, 1987; Hall & Hord, 2001). Their Concerns-Based Adoption Model (CBAM) amounts to a generic implementation scaffolding for leaders to move an initiative from its initial adoption to its use by the end-users. Designed specifically around the unique characteristics of an educational environment, the CBAM focuses on "the individuals who implement a change, the change facilitators who provide assistance, and the resource systems from which supports are drawn" (Hall & Hord, 2001, p. 1). This study parallels the framework of the model in that they contend the values, attitudes, beliefs, and concerns of the individual teacher is the key to successful implementations. While the model's focus is on the needs of the individual teacher, it outlines a framework for educational leaders to address these individual teacher needs. In doing so, the CBAM reflects the significant role of leadership during the implementation phase on teacher's attitudes, beliefs, and concerns about the educational initiatives.

"Administrator leadership is essential to long-term change success" (Hall & Hord, 2001, p. 13). While Hall and Hord (2001) specifically identify administrative leadership as one of their twelve principles of change, they clearly believe the process of change involves a team of leaders to support the implementation process. In the model, they identify *change facilitators* whose role is to continuously assess the progress of the implementation of the initiative by probing and observing the staffs' daily attempt to use the initiatives. Hall and Hord's change facilitators in the educational setting match what Rogers (1995) called change agents in the broader conceptual literature. Ideally, these change facilitators are respected educational leaders including district-level support personnel, building administrators, and teacher leaders. Their cumulative findings theorize that given the presence of skilled leadership, teachers will move through a predictable set of stages of change toward the institutionalization of the initiative. Without this leadership support to address individual teacher concerns, initiatives stall and eventually become extinct as teachers choose not to change their classroom practices. Hall and his colleagues describe skilled leadership during the implementation phase as probing to identify teacher's concerns about the initiatives and the level to which they are using the initiative as it is intended to be used. This probing is followed by strategic interventions addressing individual teacher's needs related to the initiative. These interventions alleviate teacher's concerns and theoretically move the teacher along the path toward institutionalization. Furthermore, Hall and Hord identify what they describe as the *change facilitator styles* of (1) initiator, (2) manager, and (3) responder. Each leadership style influences the school culture; teacher's attitudes, beliefs, and concerns in a different manner thereby influencing the implementation of the initiatives.

The CBAM, and the research findings supporting it, contribute significantly to the understanding of the influence of the individual teacher's attitudes, beliefs, and concerns on their classroom practices. Moreover, it underscores the important role building level leadership and support play in influencing their values and beliefs. While the work of Hall, Hord, and others clearly demonstrates the importance of the individual teachers and the role of leadership, it stops short of connecting them to student achievement. What remains unclear, is the relationship between the elements of the CBAM, factors associated with test-driven accountability, and student achievement. CBAM and the instruments used to measure teacher's attitudes, beliefs and concerns will be addressed further during the discussion of the research design in the next chapter.

After reviewing the literature on leadership's impact of school improvement efforts, Blasé (1998) concludes that school improvement efforts often fail because educational leaders "often demonstrate a lack of micro politically relevant knowledge and skills in facilitative leadership, interpersonal influence, team development/group dynamics and collaborative consensual vs. conflictive-adversarial processes…" (p. 553). Similarly in his review, Marzano (2003) identifies empirical evidence showing a strong relationship between leadership and a number of elements of school culture including: (1) school mission and goals; (2) climate of the school and classrooms; (3) attitudes of teachers; (4) classroom practices of teachers; and (5) organization of curriculum and instruction. These findings provide support for the conceptual framework of this study investigating the relationships between leadership; school culture; teacher's attitudes, beliefs, and concerns; and the implementations of curriculum initiatives.

Clearly, leadership is a key component in the educational environment. Moreover, leadership and support are major determining factors in the success of educational initiatives. Specifically, a leader's understanding and management of the complex school culture can influence teacher's attitudes, beliefs, and concerns and the implementation of initiatives.

Summary of Factors Influencing Implementation

Referring back to Figure 2 on page 20, a contention of this study was that teachers' classroom practices are influenced by their individual values and beliefs. These individual values and beliefs are influenced by a complex interaction of the existing school culture; teacher's perceptions of the district curriculum initiatives and the embedded test-driven accountability system; and leadership and support elements within the school environment. The sum of these factors influences teacher's decisions to implement the curriculum initiative and ultimately its institutionalization. Evans (1993) provides support for the study's conceptual framework by identifying four *impediments* to school improvement initiatives. Evan's impediments include (1) the substance of the initiatives; (2) the staff's response to the initiatives; (3) the contextual setting surrounding the initiative; and (4) the leadership facilitating the initiative. These impediments parallel the elements involved in this study: (1) the merits, perceived or otherwise, of the curriculum initiative and test-driven accountability; (2) teacher's attitudes, beliefs, and concerns about the curriculum initiatives; (3) the individual school's culture; and (4) factors related to leadership and support for the initiatives.

Building on Evans' work, this study further contended that student performance on tests associated with these initiatives is linked to the combination of these four factors. Essentially, the independent variables of (1) individual teacher's attitudes, beliefs, and concerns about the curriculum initiatives and test-driven accountability; (2) existing school culture; and (3) characteristics of leadership and support affect the dependent variables of implementation level and student performance on the state assessments. Arguably, the link is far more complex than described. First, these independent variables were not manipulated or controlled by the study, but instead only observed and crudely measured. Moreover, conditions influencing student achievement extend far beyond the contextual variables listed in this study.

What remains to be established in this review is a connection between the school contextual factors discussed and student achievement. With a synthesis of the four components of Evan's framework in place, this review, in support of the study's conceptual framework, will discuss how these contextual variables, at least in part, contribute to student achievement.

Student Achievement

Student achievement is a complex issue. The first question involves defining achievement and accurately measuring learning. The second issue is determining factors influencing a particular measure of achievement. This section will not pursue the answer, or engage in the debate, surrounding the first question of defining and measuring learning. Instead, this study defined student achievement as performance on standardized assessment. In the following section, the second issue will be addressed by first discussing evidence linking standards-based curriculum initiative to student performance on standardized assessments. Secondly, the contextual factors of school culture, leadership, and teacher's concerns will be discussed as they relate to student achievement.

A multitude of factors contribute to student performance on standardized assessments ranging from individual ability, motivation, and background to the larger influences of the educational institution attended by the individual. While the existing research is in no way definitive, there is evidence that particular characteristics of school culture, teachers, and leadership contribute, at least in part, to student achievement gains on standardized assessment. Moreover, these contextual factors may be sufficient to overcome social and economic background inequities. Identifying the importance of school culture and teacher’s values and beliefs on achievement, Deal and Peterson (1999) conclude, “organizational culture is critical to successful improvement of teaching and learning” and the “underlying norms, values, traditions of a school contribute to achievement gains” (p. 5). Furthermore, conceptual models for educational improvement clearly point to the important role of leadership in influencing factors related to student performance (Bell, 2003; Chubb & Moe, 1990; Marzano, 2003).

Linking Standards-Based Curriculum to Student Achievement

A major assumption of this study was that the district curriculum initiatives under investigation in the study, if implemented as intended, would improve student performance on the state assessment. Clune (2001) puts forth a conceptual theory of standards-based reform in support of this assumption. The theory, based on simple cause and effect logic, contends that standards-based reform policies are adopted by policymakers causing districts to adopt standards-based curriculums, which in turn result in higher student achievement on assessment measuring the adopted standards. In this study, the standards-based reform policy was represented by the NCLB legislative. The district curriculum initiatives under investigation were aligned with both national and state mathematics standards. If the initiatives are implemented as designed, they should improve student performance of the state assessment of these standards. In discussing the alignment of curriculum with standards, Spillane and Louse (2002) state, “what gets taught [in school] is a strong predictor of student achievement” (p. 84). Similarly, Supovitz (2001) finds limited research support “that increased use of standards-based teaching practices results in higher levels of student achievement” (p. 87).

A number of recent empirical studies have found evidence of increases in the standardized assessment scores related to the use of commercial standards-based mathematics programs (Briars & Resnick, 2000; Reys, Reys, Lapan, Holliday, & Wasman, 2003; Riordan & Noyce, 2001). Briars and Resnick (2000) studied the implementation of a standards-based mathematics program over a three-year period in the elementary schools of the city of Pittsburgh. They found “standards-based policies for mathematics produced an overall rise in mathematics achievement in the district” (p. 22). In addition to providing evidence linking standards-based initiatives to student performance of standardized assessment, Briars and Resnick also identified significant difference in student performance based on the fidelity with which the standards-based initiative was institutionalized. The study defines *strong implementation* schools and *weak implementation* schools based on the progress of individual teachers in using the initiative stating that “strong implementation schools showed two to five times more students meeting the standards than weak implementation schools” (p. 26). These findings are particularly relevant to this study in that it points to the individual nature of the implementation. Moreover, these findings underscore this study’s contention that ultimately, it is the individual teacher who determines whether the initiative is incorporated into their daily classroom practices as intended.

Briars and Resnick did not address the causes of the differing degree of implementation. This study contended these differing degrees of implementation, and the resulting assessment scores, are related to school contextual factors and individual teacher's attitudes, beliefs, and concerns about the initiative. Stated simply, if the fidelity of the adoption of standards-based curriculum initiative impacts student performance of standardized assessments as Briars and Resnick's findings suggest, then what is the relationship between teacher's attitudes, beliefs, and concerns regarding the initiative and standardized assessment scores?

Linking School Culture, Teacher's Concerns, and Leadership to Student Achievement

One of the landmark studies on factors influencing student achievement was conducted by Chubb and Moe in the 1980's. They gathered data on approximately 20,000 students, teachers, and administrators in over 1,000 public and private high schools in the nation in an attempt to determine if organizational and control factors influence student achievement. After quantitatively analyzing 220 different potential contributing factors, Chubb and Moe identified three main influences on student achievement; namely (1) student ability, (2) school organization, and (3) family background. In prioritizing these factors, the study finds "that a well-organized school can make a meaningful difference for student achievement, regardless of the ability and background of its students" (p. 129) indicating that this factor attributes to approximately one-half year of academic growth. Chubb and Moe state:

> …it appears that school organization and performance are indeed related. High performance schools differ in goals, leadership, personnel, and educational practices from low performance schools. Their goals are clearer and more academically ambitious, their principals are stronger educational leaders, their teachers are more professional and harmonious, their course work is more academically rigorous, and their classrooms are more orderly and less bureaucratic….informal organizational differences may be far more important than formal ones.
>
> High and low performance schools appear to be distinguished more by their leadership, professionalism, and teamwork…than by their graduation requirements, or homework and writing assignments. This has potentially important implications for school improvement. If school success really depends on the development of a professional, teamlike organization, improvement will be harder to bring about…if it hinges on the imposition of rigorous requirements. (p. 109-110)

The findings are significant because the characteristics used by Chubb and Moe to describe a *well-organized* school parallel those factors loosely identified as the independent variables of school culture and leadership in this study. Chubb and Moe portray well-organized schools as having shared goals and a clear mission for student achievement; clearly, components of school culture as defined by this study. The findings also numerate characteristics of teachers' values and beliefs that reflect (1) cooperation and collegiality; (2) strong teacher efficacy; and (3) involvement in decision-making. Finally, leadership factors in a well-organized school contributing to student achievement include demonstrating a clear vision and motivating teachers toward that vision. Chubb and Moe did not examine the effect of a particular curriculum initiative on student achievement as in this study. However, their findings did identify student academic tracking as having an influence on achievement. This may point, in part, to the influence of specific standards-based curriculum content on achievement; again underscoring the influence of these types of curriculums on student achievement.

Though the findings of Chubb and Moe provide considerable support for the argument put forth in this study, it is worth noting that their overall conclusions are suspect. After extensive data collection and convincing analysis to determine factors influencing student achievement, Chubb and Moe used this information to present the ideological argument for the deregulation of public education by advocating school choice as the only way to achieve well-organized schools. Their findings are significant in the realm of student achievement; however, their overall conclusion about system-wide educational reform is somewhat disconnected from the study's research questions regarding the factors that influence student achievement.

In a more recent case study of five large, high poverty school districts from different parts of the country, Togneri and Anderson (2003) found common themes in districts demonstrating substantial improvement in student standardized assessment scores over a three-year period. The study's ex post facto design identified schools that had shown improved student achievement in math and reading scores across grade levels and ethnic and racial subgroups then sought to understand how these gains were brought about. The study's findings confirm the conclusion put forth by Chubb and Moe by identifying a number of school cultural and leadership factors contributing to student achievement gains including (1) shared norms of improvement (2) a strong committed staff; (3) flexible, distributed school leadership; and (4) elements of instructional support. Togneri and Anderson also identified a strong curriculum reform initiative in each of the five districts. As did Chubb and Moe, they found these contextual factors able to equalize achievement gains despite individual student's socioeconomic backgrounds.

In his most recent work *What Works in Schools: Translating Research into Action*, Marzano (2003) synthesizes the empirical research findings on factors influencing student achievement. He identifies school factors such as challenging goals and staff collegiality and professionalism along with teacher factors including curriculum design and instructional strategies as playing a significant role in student achievement. In his conclusions, Marzano proposes a model for educational leadership in support of school, teacher, and student factors affecting student achievement. As stated in the introduction to this section, the topic of student achievement is complex and boundless. Clear cause-and-effect relationships are allusive.

The goal of this section is to show support for the idea that school contextual factors and curriculum initiatives can contribute to improvements in student achievement. First by establishing that standards-based curriculum initiatives do lead to improved student performance on standardized assessment. Furthermore, the literature confirms that variations in implementation of the intended initiative design also can influence student performance. Secondly, by providing evidence in the form of large-scale investigations in support of the study's conjecture that school culture, leadership and individual teacher's attitudes, beliefs, and concerns account, in part, for student performance.

Summary

This review has summarized the current literature on the elements relevant to the focus of this study. The conceptual framework of this study contended that while school contextual factors individually play a role in determining the successful implementation of district curriculum initiatives, the cumulative effect of these factors manifests itself in individual teacher's attitudes, beliefs, and concerns. Figure 14 presents a visual representation of the study's conceptual framework showing the underlying relationship between each contextual factor. Individual attitudes, beliefs, and concerns influence a teacher's decision to change their classroom practice to match the design of the initiative. Assuming the curriculum initiative, if adopted as intended, will improve student performance on statewide-standardized assessments, these individual teacher's attitudes, beliefs, and concerns influence student performance on these assessments.

After describing the conceptual framework of the adoption process of educational initiative, the review presented literature identifying a major cause of innovation failure as the interrelated contextual factors within school environment. The focus then shifted to four critical elements within the larger school context by detailing their individual influence on the implementation phase of the adoption process. The first of these elements is school culture; a shared set of values and norms; individual values and norms; and standards for interaction and relationships within a school. Particular types and characteristics of school culture facilitate the implementation of educational initiatives.

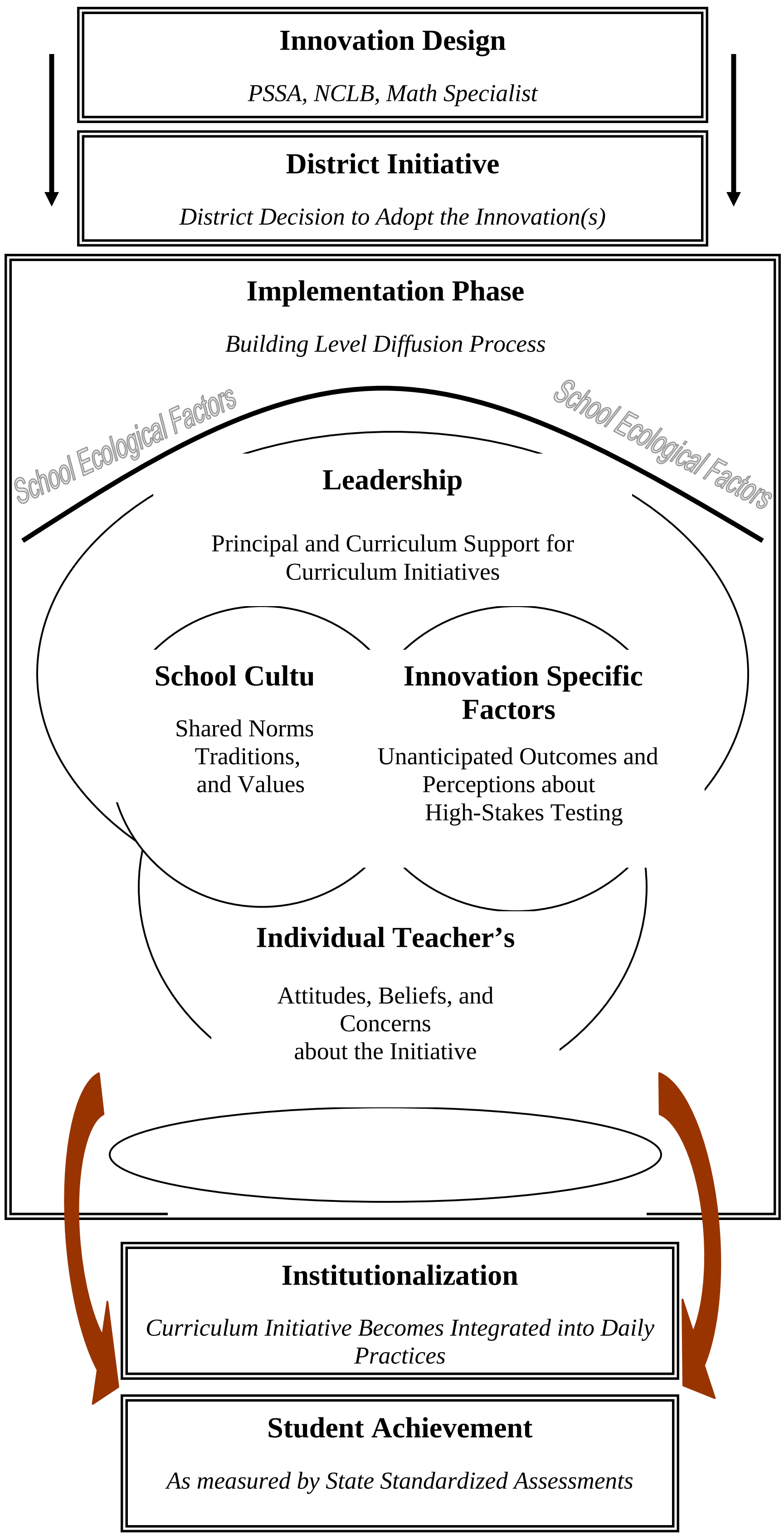


Figure 14. Linking School Contextual Factors to Student Achievement.

School culture both influences and is influenced by individual teacher’s attitudes, beliefs, and concerns. The literature clearly illustrates the significance of teacher’s attitudes, beliefs, and concerns in determining their classroom practices. Moreover, individual teacher attitudes and concerns associated with the initiative itself also influence their classroom practices. Both unanticipated outcomes of test-driven accountability systems and teachers’ perceptions of those systems were discussed. Finally, the review identified building leadership qualities and support elements that have a significant influence on both school culture and teacher’s attitudes, beliefs, and concerns. In closing, the review presented how these contextual factors are linked to student performance.

This review provided support for the conceptual framework of the study, which explored the following questions:

1. How did teacher’s attitudes, beliefs, and concerns about test-driven accountability relate to the implementation of mathematics curriculum initiatives?
2. How did a teacher’s implementation of mathematics curriculum initiatives relate to student achievement on state assessments?
3. How did teacher’s attitudes, beliefs, and concerns about test-driven accountability relate to student achievement on state assessment?
4. What was the influence of principal and curriculum leadership on teacher’s attitudes, beliefs, and concerns?
5. What was the influence of school culture on teacher’s attitudes, beliefs, and concerns?

Recent empirical work has begun to identify school contextual factors that may be able to overcome other predetermined contributing factors of student achievement such as socioeconomic status and family background. Here lies the significance of this study; exploring the school contextual environment in order to better understand those factors that may improve the achievement of all students regardless of their background.

CHAPTER THREE: METHODOLOGY

Research Approach and Rationale

This study investigated themes and patterns within the complex school environment that influences the implementation of mathematics curriculum initiatives. The influences of the contextual factors consisting of teacher's attitudes, beliefs, and concerns; school culture; and leadership during the implementation process were the focal point of the study. Additionally, the study investigated the effects of these contextual factors on student achievement. As a result, the study's research questions were both exploratory in the sense that each will attempt to generate new theories about the influences of contextual factors on implementation and at the same time confirmatory by verifying these theories with student achievement scores. This combination of exploratory and confirmatory attributes leads the research design to a mix of both qualitative and quantitative methods. "A major advantage of mixed methods research is that it enables the researcher to simultaneously answer confirmatory and exploratory questions, and therefore verify and generate theory in the same study" (Teddlie & Tashakkori, 2003, p. 15).

This study featured a primarily qualitative design while concurrently employing quantitative procedures to triangulate the qualitative data. Creswell (2003) describes this design as a *concurrent nested strategy* meaning that both types of data are collected simultaneously with one type having a significantly larger role in the study than the other. Figure 15 visually depicts two models of this mixed methods strategy from the perspective of Creswell (2003) and Creswell, Clark, Gutman, and Hansen (2003). Both models illustrate how the qualitative method is dominant and the data collection occurred simultaneously during the data collection phase of the research.

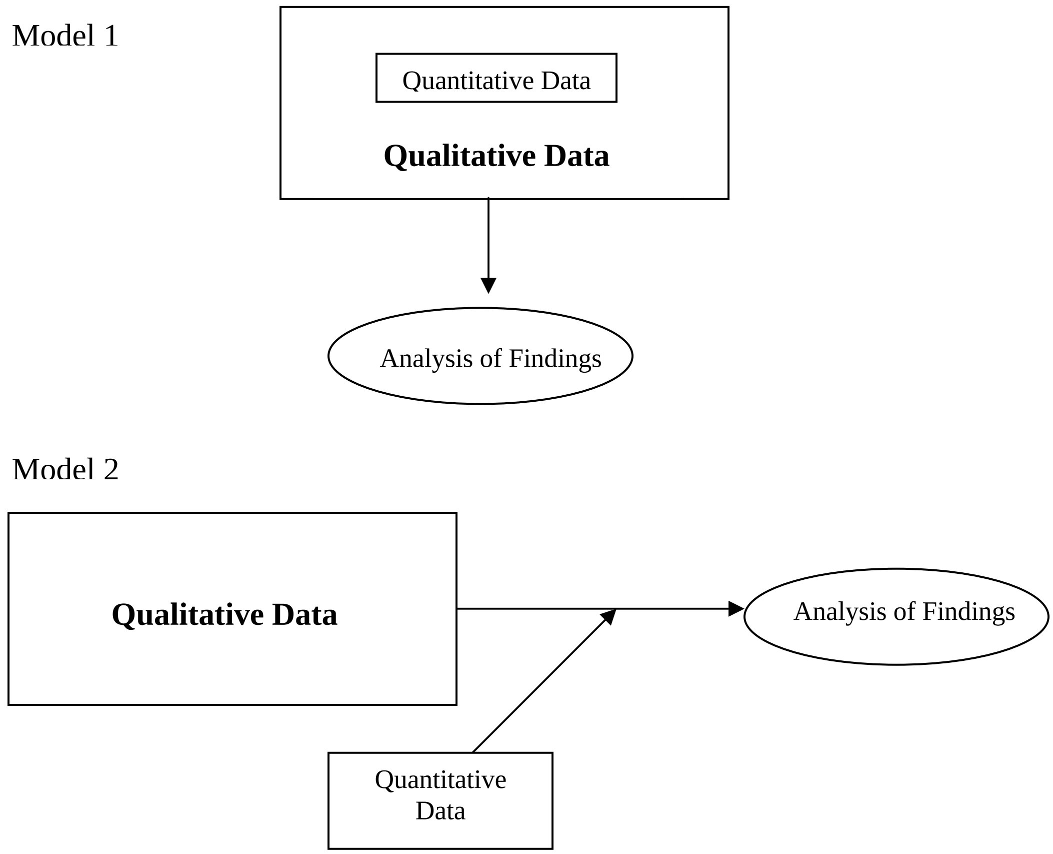


Figure 15. Visual Models of Concurrent Nested Research Design.

Models adapted from Advanced Mixed Methods Research Designs (p. 214) by J. W. Creswell, V. L. Plano-Clark, M. L. Gutman, & W. E. Hanson in A. Tashakkori & C. Teddlie (Eds.), *Handbook of Mixed Methods in Social & Behavioral Research*, 2003, Thousand Oaks, CA: Sage. Copyright 2003 by Sage. Reprinted with Permission of the publisher.

Qualitative Methods

The dominant research perspective in this study was qualitative. The study's goals parallel the broad goals of qualitative methodology. A primary goal of this study was to develop a better understanding of the interaction and interrelatedness of the complex elements of school culture, leadership, and teacher's perceptions influencing the implementation process of mathematics curriculum initiatives. The qualitative research paradigm is best suited when the study attempts to develop a better understanding of complex phenomena such as culture, change, and individual's perceptions and experiences (Marshall & Rossman, 1999; Newman, Ridenour, Newman, & Demarco, 2003). Miles and Huberman (1994) concur stating that qualitative research methodology is appropriate when the study's goals are to discover regularity in complex phenomena through identification and categorization of its elements and exploring their connections.

The dominant research perspective was that of examining a system in a holistic inductive manner allowing different questions and themes to emerge during the investigation as new understandings develop. This qualitative research design strategy is described by Patton (2002) as *naturalistic inquiry*, where real world situations are examined without artificial manipulation and control by the researcher. Patton also identifies strengths of this qualitative design as emergent and flexible as the design provides for the "openness to adapting [the] inquiry as understanding deepens and/or situations change" (p. 40).

The qualitative approach also is particularly well equipped to study the implementation process of new program initiatives as in this study. Often the intended design of the initiative is adapted during the implementation process based on individual circumstances. The understanding of these adaptations and the reasons behind them was among the goals of this study. Patton articulates the importance of qualitative methodology when evaluating the adoption of new programs stating:

> …a process of ongoing adaptation to local conditions characterizes program implementation…The methods used to study implementation should correspondingly be open-ended, discovery-oriented and capable of describing developmental processes and program changes. Qualitative methods are ideally suited to the task of describing such program implementation…Failure to monitor and describe the nature of implementation, case by case, program by program, can render useless standardized, quantitative measures of program outcomes.

The focus of this study was the linkage between these local contextual conditions influencing program implementation and student achievement.

Ethnographic Design

In order to describe these local contextual conditions – school culture, leadership and teacher's attitudes, beliefs, and concerns – an ethnographic design was employed. Wiersma (2000) describes the ethnographic research process as "the process of providing holistic and scientific description of educational systems, processes, and phenomena within their specific context" (p. 232). The ethnographic methods permit the research to reveal the complexities within the educational phenomena under investigation (Wiersma, 2000). This design strength facilitated the understanding of the influences of the local contextual conditions of school culture; leadership; and teacher's attitudes, beliefs, and concerns on the implementation of curriculum initiatives. It is the lack of understanding of these contextual factors that Sarason (1990) identifies as the major obstacles to the successful implementation of many educational initiatives. The mathematics curriculum initiatives under investigation in this study required individual teachers to change their instructional classroom practice. As discussed in the previous chapter, the implementation of such initiatives is highly context-dependent relying on individual teachers to adapt their instructional practice as they implement the initiatives. The research questions in this study addressed school contextual factors that influence individual teacher decisions during the implementation of curriculum initiatives. Fetterman (1989) describes this ethnographic process as *contextualization* where the researcher links micro-behaviors to the larger contextual conditions that influence these behaviors thereby bridging the gap between the different understandings of the same situation.

Smith (2001) addresses this strength of ethnographic research as it breaks down complex jobs into smaller routines, which can be understood by those not working in the environment being studied. Smith summarized the point:

> The vantage point of ethnographic researchers – the direct experiences, the sustained observations, or the immersion – has allowed a degree of penetrations into the inner workings of an occupation or a work setting that is not easily attained by other approaches. Sustained involvement and observation have been especially productive because the defining features of professional work – unpredictability, variety, the formal absence of routinization of tasks and activities – necessitate that researchers be

> available to observe the unexpected to opportunistically focus on events and interactions as they arise. (p. 223)

The professional lives of teachers; their perceptions of new curriculum initiatives; and the conditions under which they work in the form of school culture and leadership were a central focus of this study. The ethnographic methodology employed in the study's design facilitated the understanding of these complex contextual factors.

In addition to understanding the phenomenon, bridging the gap between different perspectives of the phenomenon is one of the primary goals of ethnographic research (Agar, 1986; Fetterman, 1989; Jorgensen, 1989; Newman, Ridenour, Newman, & Demarco, 2003; Smith, 2001). Ethnographic research designs allow the researcher to describe and explain the insider's views of a phenomenon so that those on the outside can better understand the reasons contributing to the individual's actions related to the phenomenon (Jorgensen, 1989). This attribute allowed the study to explain factors that facilitate and impede the implementation of mathematics curriculum initiatives from the teacher's perspectives of these initiatives in the context of the test-driven accountability system imposed by NCLB. It is the gap between the individual teacher's perspectives of the implementation of the curriculum initiatives and the perspectives of those on the outside designing the initiatives that this study attempted to narrow. Agar (1986) addresses a strength of ethnographic research as "a process of *mediating frames of meaning*" (Giddens, 1976). Ethnography is neither subjective nor objective; it is interpretive, mediating two worlds through a third" (p. 19). The interrelated *worlds* alluded to by Agar in relation to this study were (1) the world within individual schools from the teacher’s perspective; (2) the world of the larger educational community; and (3) the world as viewed from the researcher’s perspective.

The research questions in this study specifically addressed how teacher’s perspectives – their attitudes, beliefs, and concerns – about mathematics curriculum initiatives and the system of test-driven accountability affects their implementation of those initiatives and impacts student achievement scores. In addition, the study investigated the influence of the larger school culture and school leadership factors on teacher’s perspectives. In Figure 16, Wiersma (2000) illustrates the way ethnographic research is useful in explaining how a variety of different perspectives interact with a culture of an organization. Wiersma states that in order “to understand an organization…ethnographic research is conducted form the inside, outward. That is, the researcher begins with the perspectives of one or more defined groups and uses them to describe one or more cultures” (p. 242).

This study’s ethnographic design matches the highly context-dependent implementation process of the curriculum initiatives under investigation in this study. As a result, the ethnographic design is well suited to address the research questions of this study, as it will facilitate the understanding of these conditions at the local level (Wiersma, 2000). Moreover, the study’s focus on individual teacher’s perceptions and school culture is particularly conducive to the ethnographic design.

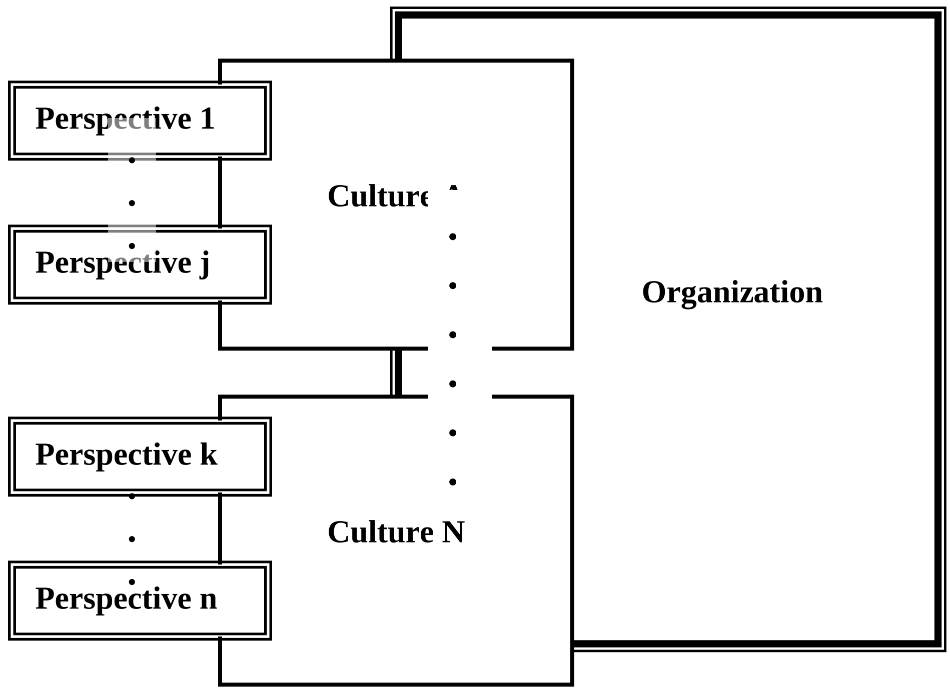


Figure 16. Interaction of Perspectives, Culture, and Organizational Context.

Note. Adapted from *Research Methods in Education: An Introduction, 7e* (p. 243) by W. Wiersma, 2000, Boston: Allyn and Bacon. Copyright 2000 by Allyn & Bacon. Reprinted with Permission of the publisher.

Triangulation with Quantitative Methods

As part of the mixed method design, this study incorporated a quantitative component to facilitate the *cross-validation* of the qualitative methodology (Wiersma, 2000). Given that teacher's attitudes, beliefs, and concerns were a significant component of this study, teachers participating in the study were surveyed in order to measure their perception of the test-driven accountability system in which the mathematics curriculum initiatives under investigation are rooted. An independently validated questionnaire was employed to support the qualitative cross-validation by adding an additional data collection procedure along with an additional data source. This data was used to verify the qualitative data gathered by the researcher serving as a participant observer.

Wiersma (2000) describes triangulations of ethnographic research as the "convergence of multiple data sources or multiple data-collection procedures" (p. 252). Figure 17 illustrates how cross-validation will be used in measuring teacher's attitudes, beliefs, and concerns in this study. The specifics of each data collection procedures – observations, interviews and the questionnaire – are discussed in the data collection section of this chapter.

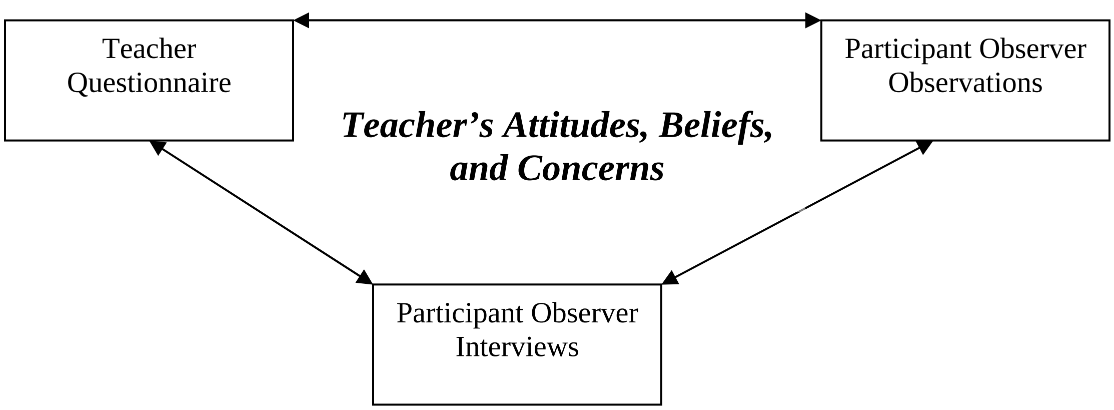


Figure 17. Triangulation of Data Collection Procedures.

Site and Participant Selection

"Ethnographic research involves the field study of the ways of life of a delimited set of people…in a restricted area or setting" (ten Have, 2004, p.131). The following section describes the purposeful selection of the research site and participants providing both descriptions of each along with the rationale for their selection.

Site Selection – The District

The study was conducted using four middle schools in a suburban Philadelphia School District. The district serves a middle-class community of approximately 70,000 residents located in southeastern Pennsylvania. Covering 28 square miles and comprised of multiple townships, the district's 13 schools are attended by nearly 10,000 students annually. The school district uses a kindergarten through grade 5, grade 6 through 9, and grade 10 through 12 configuration where students in kindergarten through grade 5 attend one of the district's eight elementary schools; students in grade 6 through grade 9 attend one the district's four middle schools; and all students finish their high school education at the district's one high school facility.

The curriculum leadership structure in the district was in a state of transition. Prior to the 2004-2005 school year, curriculum coordination was provided solely by one Lead Teacher in each content area. These Lead Teachers had a reduced teaching responsibility and were available approximately 50 percent of the school day in order to provide curriculum support to other teachers in their subject area throughout the district. The type of support provided includes (1) curriculum and standards alignment; (2) selection and purchasing of textbooks; (3) staff development; and (4) communication between levels and grades within the department. The lead teachers were supported by department chairpersons in each secondary building. Most recently, the lead teachers, particularly in mathematics, reading, and language arts, were also responsible for assuring that the district met the mandates of the NCLB legislation. Because of these additional responsibilities, the district instituted a number of initiatives designed to assist the lead teacher of mathematics in addressing the requirements of NCLB. Beginning in the fall of 2004, the district hired two additional teachers to serve as Mathematics Coaches at the middle and high school levels. The Mathematics Coaches' responsibilities included (1) communicating the mandates and expectations of NCLB; (2) coaching the teaching staff on the implementation of curriculum changes; and (3) tutoring students identified as academically at-risk in the area of mathematics. The Mathematics Coaches worked in cooperation with the mathematics lead teachers to support the implementation of curriculum initiatives designed to improve student achievement on assessments mandated by NCLB. The Mathematics Coach positions were a component of the overall district improvement plan designed to improve student achievement on state-mandated assessments.

Site Selection - The School

The district's middle schools varied in size of their student population along with the demographic composition of the populations. Additionally, the administrative and teaching staff differed in size and experience. Moreover, two of the schools were nationally recognized as Blue Ribbon schools while one received a warning from the Pennsylvania Department of Education for not meeting the Adequate Yearly Progress as defined by NCLB. Table 3 depicts the various differences and similarities among the four schools.

The staff at each school was organized into middle school teams of teachers consisting of a social studies teacher, a language arts teacher, a science teacher, a mathematics teacher, and a special education teacher. Each team was responsible for between 100 and 120 individual students at a particular grade level. In addition to their content area teaching responsibilities, middle school team teachers taught a daily *Instructional Opportunity Period* (IOP) during which students are exposed to a variety of different learning opportunities.

Table 3

Various characteristics of each middle school

School	Number of Students	Number of Teachers	Principals	Percentage of Students from Low Income Families	Percentage of Students with Learning Disabilities	2004 Grade8 Mathematics PSSA Scores	National Blue Ribbon School of Excellence	Met NCLB AYP in 2004
School A	767	59	2	12%	4%	1450	No	Yes
School B	1067	85	3	12%	5%	1430	Yes	No
School C	823	61	2	5%	5%	1430	Yes	Yes
School D	604	50	2	9%	5%	1360	No	Yes

The specific structure and content of the Instructional Opportunity Period is determined by the local team of teachers and included such activities as (1) reading workshop, (2) content area mini-units, (3) activity periods, (4) clubs and specific interests, (5) interdisciplinary activities, (6) academic assistance and tutoring, and (7) reward activities. The goal of many of the curriculum initiatives implemented during the 2004-2005 school year involved changing the focus and flexibility of this Instructional Opportunity Period. The initiatives required teachers to focus the Instructional Opportunity Period toward the content areas of mathematics and reading. Moreover, students identified as *academically at-risk* received additional tutoring and support during this period from the Mathematics Coach.

Rationale for Site Selection

The four middle schools in the suburban Philadelphia school district were chosen for this study for a number of reasons. First, the researcher had access to the middle schools in the school district as part of his normal work routine allowing the participant observer to spend eight to twelve hours per week in each of the four middle schools. The access to the setting followed by long-term immersion in the environment to be studied is a key foundation to meaningful ethnographic research (Fetterman, 1989; Marshall & Rossman, 1999). The researcher spent approximately ten months – about 30 visits – in each of the four middle schools prior to the collection of data. During that time, the researcher was able to build the trust of the target populations in each of the buildings. The development of these cooperative relationships is another essential component of successful ethnographic research (Jorgensen, 1989).

Additionally, the four middle schools selected were also involved in implementing new district curriculum initiatives designed to improve student achievement on state mandated assessments at the eighth grade level. The curriculum initiatives included:

(1) The restructuring of a block of time previously used for non-instructional purposes to provide additional mathematics instructional support to academically at-risk students.

(2) The introduction of a Mathematics Coach to provide in-classroom support for teachers during their regular mathematics classes and during the restructured block of time designed to provide additional support to academically at-risk students.

(3) The availability of additional resource materials specifically designed to focus teachers' instructional practices to match the standards used for assessment at the eighth grade level by the test-driven accountability system

The design facilitated the control of potential confounding variables such as differences in the community, differences in the district priorities; differences in funding; and differences in teacher quality and job satisfaction. By selecting the same school district, each of these overarching school ecologically factors was held consistent in each of the four middle schools while differences in the school culture and leadership factors could be extrapolated from the four individual schools.

Participant Selection – The Teachers

The sampling design involved the purposeful selection of mathematics teachers involved in the implementation of district curriculum initiatives aimed at improving achievement of students in the eighth grade. This population was chosen because the teachers were the focal point of a number of new district curriculum initiatives in the district. Each teacher had been required to change their individual classroom instructional practice as each attempted to implement the mathematics curriculum initiatives.

Patton (2002) defines this type of purposeful selection of the participants as *intensity sampling* where the sample is chosen because of its "information-rich cases that manifest the phenomenon intensely" (p. 243). This population provided the researcher with both the availability to investigate a wide range of teacher's attitudes, beliefs, and concerns and the flexibility to explore new questions as they emerged.

Fetterman (1989) describes this flexibility to explore new questions by refocusing on different participants as judgmental sampling where the "ethnographers rely on their judgment to select the most appropriate members of the subculture or unit" (p. 43). This design allowed the participant observer to explore in depth those teachers who demonstrated particularly strong or weak attitudes, beliefs, and concerns about test-driven accountability thereby adding to the understanding of the phenomenon being studied.

The available population of the mathematics teachers at the eighth grade level in each of the four middle schools is listed in Table 4. Volunteers from this population were asked to participate in the study prior to beginning the data collection.

Table 4

Available eighth grade teacher population in each middle school

SCHOOL	EIGHTH GRADE MATHEMATICS TEACHERS	EIGHTH GRADE SPECIAL EDUCATION TEACHERS
School A	3	2
School B	3	1
School C	2	2
School D	3	2

Data Collection Procedures

The data collection methods parallel the overall approach to the rationale established by the research design while addressing specific aspects of each research question. This section provides an overview of the primary data collection instrument of a participant observer including the rationale for using the procedures of informal observations and interviews. The discussion continues by outlining the specific data collection procedures and frameworks used for each element of school context investigated in the study. The triangulation of data is addressed as the procedures for measuring each of the elements is described. The section concludes by providing a tentative timeline for the collection of data.

Instrumentation - Participant Observation

The primary data collection instrument employed in this study was that of participant observation. Marshall and Rossman describe participant observation as "both an overall approach to inquiry and a data-gathering method" (p. 106). "Ethnography…is characterized by two demands on researchers: one as observing a setting and gathering data, and the other as being directly involved in the setting under study including the researchers as themselves objects of inquiry" (Freebody, 2003, p. 76). The researcher's position as Middle Level Mathematics Coach was itself part of the broad improvement initiative undertaken by the school district. As a function of the job responsibilities, the researcher was an active participant in the implementation of the mathematics curriculum initiatives by serving as teacher coach during the implementation phase. The Mathematics Coach's responsibilities were multifaceted including: (1) the alignment of instruction with the district's mathematics curriculum; (2) developing mathematics resource materials designed to focus teachers' instructional practices; (3) communication of the requirements and expectations associated with the NCLB and the PSSA; (4) providing staff development and in-class assistance to teachers implementing the district mathematics curriculum; (5) providing leadership in the restructure of the Instructional Opportunity Period to focus on improving student PSSA performance. Moreover, the researcher also directly participated in the delivery of the mathematics curriculum initiatives to students. Smith (2001) describes the advantage of using the researcher as a participant observer in stating the following:

> Ethnographic studies have been invaluable for the contemporary understanding of work. Researchers have mined the situations and perspectives of workers through their own lived experiences as participant observers, both as workers and as witnesses. By engaging in the same social processes, confronting the same organizational, technological, and administrative structures, and being implicated in the same relations of power and control, the ethnographic field researchers have acquired a type of data that is simply unattainable using other modes of enquiry. (p. 229)

The researcher's role as Middle Level Mathematics Coach provided both the access and immersion in each of the middle schools selected to participate in this investigation necessary to obtain the type of data Smith describes. These facets – access to and immersion in the setting – are the essential first steps in establishing the foundation of ethnographic research (Agar, 1986; Fetterman, 1989; Jorgensen, 1989; Kirk & Miller, 1986; Patton, 2002). Patton (2002) discusses the second stage of observation fieldwork after entry into the setting as "routinization" (p. 318) where the researcher moves beyond the role of just an onlooker toward a trusted participant in the setting routines. Jorgensen (1989) points to a similar component of the data collection using participant observation in discussing what he describes as the need to "establish and maintain relationships with natives in the field" (p. 14). The establishment of the routinization in the setting is the key to high-quality qualitative data collection (Patton, 2002).

The researcher in this study worked directly with teachers and building leaders to assist with the implementation of mathematics curriculum initiatives designed to improve student performance on state assessments. These responsibilities fall within the normal function of the role of Mathematics Coach. As a result, the *routinization* described by Patton and the *relationship* described by Jorgensen were well established as the researcher worked in each middle school setting and with each of the study's participants over a period of ten months prior to the collection of data. This design – researcher as participant observer – provided an opportunity to gather data in the school's natural working environment without interfering with the participants' normal routine or unintentionally influencing their behavior.

In addressing ethical issues regarding the researcher's job status in relation to the study's participants, the Mathematics Coach worked on a collegial level with the study's teacher participants. The researcher did not rate, evaluate, manage, or supervise the teachers involved in implementing the mathematics curriculum initiatives. The researcher's role was that of supporting the implementation of these initiatives. Moreover, the initiatives under investigation in this study were voluntary initiatives requiring teachers to interact with the Mathematics Coach only at times and frequencies of their own choosing. In addition, the researcher's job status was not influenced by the success or failure of the implementation of the mathematics curriculum initiatives involved in the study.

Collection Procedures

One of the strengths of an ethnographic design with a participant observer as the primary instrument is the ability to describe the context being studied from the perspective of those working in the environment (Jorgensen, 1989; Patton, 2002; Wiersma, 2000). It is the school contextual factors of (1) school culture; (2) leadership; and (3) teacher's attitudes, beliefs, and concerns that occur during the implementation of mathematics curriculum initiatives that were the focus of the study. The participant observer can both view the implementation process from the perspective of an individual school setting while at the same time detect patterns and relationships not apparent to those working in the setting (Patton, 2002). The researcher's own experiences and perspective also play a role in the collection of data (Patton, 2002; ten Have, 2004). Data was collected primarily through the use of informal observations and interviews of the study's participants thereby permitting the researcher's experiences in the school setting to guide the data collection as new themes and patterns emerged. A questionnaire was used to triangulate the observation and interview data in the area of teacher's attitudes, beliefs, and concerns.

Table 5 delineates the five areas that were measured based on the study's five research questions along with an overview of the data collection instruments, procedures and sources associated with each area.

Table 5

Overview of data collection instruments, procedures, and sources

Area to be Measured	Collection Instrument	Collection Procedures and Source
Teacher's Attitudes, Beliefs, and Concerns about PSSA Initiatives	Participant Observer	Informal Teacher Observations Informal Teacher Interviews
	Questionnaire	Teachers Stages of Concern Questionnaire
School Culture	Participant Observer	Informal Observations Informal Teacher Interviews
Leadership Factors	Participant Observer	Informal Leader Observations Informal Teacher and Leader Interviews
Teacher Implementation of Initiatives	Participant Observer	Informal Classroom Observations Informal Teacher Interviews
Student Achievement	Document Retrieval	2004 (prior) PSSA Scores 2005 (post) PSSA Scores

Rationale for Informal Observations

The participant observer used the process of informal observations over the course of a three-month period of time. While ethnographic observations are continuous and comprehensive, they also are relatively unstructured (Wiersma, 2000). Specific observation times, durations, and schedules were not developed. Rather, observation data was collected during the course of normal working interactions with each school setting and each participant. This design allows the process of inquiry to be more open-ended and discovery-oriented (Jorgensen, 1989; Patton, 2002). The flexible and opportunistic nature of the ethnographic research relies on the ability of the researcher to constantly redefine the questions and problems during the data collection process (Jorgensen, 1989). Fetterman (1989) states:

> …[observation] begins with a panoramic view of the community, closes in to a microscopic focus on details, and then pans out to the larger picture again – but this time with new insight into minute details. The focus narrows and broadens repeatedly as the fieldworker searches for breadth and depth of observation. Only by both penetrating the depth and skimming the surface can the ethnographer portray the cultural landscape in detail rich enough for others to comprehend and appreciate. (p. 47)

Moreover, this flexibility allows for the identification of what Fetterman (1989) and Wiersma (2000) describe as *Key Actors* or *Informants*. These individuals can provide essential information because of their (1) special advantage point within the setting; (2) unique knowledge or insight in the phenomenon being studied; or (3) simply their willingness to participate by providing valuable information (Fetterman, 1989). Finally, the informal observation design allowed the researcher to be unobtrusive in the school setting maintaining the routine nature of the working relationships.

Rationale for Informal Interviews

In addition to the observations, the researcher conducted informal interviews of teachers and building leaders during the three-month data collection period. Informal interviews are commonplace in ethnographic research designs because of their ability to compare different perspectives and facilitate the understanding of community values and norms (Fetterman, 1989; ten Have, 2004; Wiersma, 2000). When informal interviews are conducted properly, they are transparent to the participant and "feel like natural dialogue but answer the fieldworker's often unasked questions" (Fetterman, 1989, p. 49). Moreover, the informal interview process contributed to the overall ethnographic goals of establishing and maintaining a positive relationship with the study's participants.

Jorgensen (1989) articulates both the process and benefits of using an informal interview format as a method of data collection.

> Informal interviews are like casual conversations. They differ from casual conversations mainly in being characterized specifically by a question-and-answer format. During the informal interview, you are questioning insiders about matters of interest. Like an ordinary conversation, their questioning is casual, free flowing, and unencumbered by extensive preconceptions of what and how the topics will be discussed. You may have a general set of issues to be discussed but, unlike more formal interviews, it is not necessary to ask the same questions exactly the same way each time. (p. 88)

The questioning during the informal conversation provided the researcher with the flexibility needed to explore new themes and patterns as they developed during the data collection process. A list of interview primer questions related to each research question can be found in Appendix G.

Data Recording Procedures

The vast majority of the informal observations and interviews were not scheduled events. Instead, data collection opportunities were more spontaneous and natural interactions in the course of the normal working environment. This procedure was particularly advantageous to the research questions in this study. Hall and Hord (2001) describe these types of spontaneous interactions as *incidents*; citing empirical evidence that the frequency of such encounters facilitates implementation. Simply stated, Hall and Hord found a positive relationship between the number of the interactions and higher levels of the implementation. Therefore, the frequency of participant-initiated interaction with the researcher provided insight into the individual teacher's implementation of the initiatives along with insight into their attitudes, beliefs, and concerns.

In order to accurately document each observation and interview, the researcher employed a two-column objective/reflective fieldnote procedure enhanced by recent technology. Using a digital voice recorder to facilitate the unobtrusive, naturalistic inquiry, the researcher objectively detailed the substance of each incident shortly after its occurrence. Participants were not recorded. The digital voice data was then transferred to a secure computer and anonymously categorized by school and participant. The voice data was then transcribed to text and coded according to the preliminary frameworks using the ATLAS.ti Visual Qualitative Data Analysis Software. The preliminary framework can be found in Appendix I. The researcher's reflections and interpretation of the data were also added at this time based, in part, on the anticipatory frameworks discussed in the following sections.

Specific Observation and Interview Frameworks Related to Each Research Question

While Miles and Huberman (1994) point out that ethnographic forms of qualitative research contain “relatively little standardized instrumentation at the outset” (p. 7), the observation and interviews used to collect data, though informal in nature, did not lack structure. Fetterman (1989) identifies a key component of ethnographic research as a focused description of the study’s *operationalism*. A study’s *operationalism* involves “defining one’s terms and methods of measurement” (Fetterman, 1989, p. 40). Therefore, ethnographic research must provide a preliminary skeleton framework of what the researcher will measure and how it will be measured. To provide this study’s operationalism, each element of the school context addressed by the research – school culture; leadership; and teacher’s attitudes, beliefs and concerns - was measured using a predetermined framework. Specific frameworks for the observations along with interview primer questions are discussed in the following sections. Included in the discussion is an outline of the data collection procedures for the components of each research questions.

In addition, in order to facilitate the triangulations of the primarily qualitative observation and interview data, a secondary instrument in the form of a questionnaire was employed to quantify teacher’s attitudes, beliefs, and concerns. Appendix A presents an overview of the data collection procedures associated with each research question including instrumentation, procedures, sources, and triangulation.

Assessing teacher's attitudes, beliefs, and concerns about test-driven accountability.

Four of the five research questions in this study required the researcher to describe and assess individual teacher's attitudes, beliefs, and concerns about the curriculum initiatives rooted in mandates of the NCLB legislation. The study employed participant observations and interviews along with a questionnaire designed to measure individual teacher's level of concern about an initiative. During the data collection period, the participant observer used extensive field notes to record observations and interviews with teachers and building leaders regarding their attitudes, beliefs, and concerns about the initiatives. The researcher used the *Stages of Concern* framework as laid out by the *Concerns Based Adoption Model* (Hall & Hord, 2001) as a preliminary framework for assessing teacher's attitudes, beliefs, and concerns about the mathematics curriculum initiatives.

The framework consists of seven *Stages of Concern* reflecting an individual's personal feelings about a particular initiative during the implementation phase (Ellsworth, 2001). According to Hall and Hord (2001), the first stage is *Awareness* where the teacher expresses little concern or involvement with the initiative. The first stage is followed by the stages of *Informational* and *Personal* concerns. During the informational stage, the individual goes beyond simple awareness of the initiative by actively seeking additional information about the requirement of the initiative. Personal concerns develop once information is obtained as the individual begins to ask how the initiative will impact them and/or their job status. The following stage is described by Hall and Hord as *Management* and marks the initial attempt to implement the initiative as the individual questions procedural issues and the time required to implement the change. The fifth stage of *Consequence* is underscored by concerns regarding the effects the initiative will have on students. *Consequence* is followed by the stage of *Collaboration* where teachers actively seek to cooperate with others to maximize the positive outcomes of the initiative. The final stage described as *Refocusing* is characterized by the teacher or groups of teachers making alterations in the initiative to improve the overall outcomes. This stage can also reflect a teacher's need to abandon the initiative because of deep concerns regarding its effectiveness. Appendix B contains a full description of each of the Stages of Concern.

Hall and Hord further categorize each of these stages into broader concerns. Figure 18 presents the grouping of the Stages of Concern into the categories of (1) concerns for *Self*; (2) concerns about *Task*; and (3) concerns about the initiative's *Impact*. These broader categories were used by the researcher to assess individual teacher's attitudes, beliefs, and concerns about the implementation of initiatives associated with NCLB's system of test-driven accountability.

In order to triangulate the data gathered by the participant observer, the Stages of Concern questionnaire was administered to 13 teachers involved in the study. The 35-question instrument assesses an individual level of concern as described above presenting the results in a graphic format. The questionnaire can be found in Appendix C. The design's cross-validation involved the use of multiple instruments and procedures (participant observer observations; participant observer interviews; and the Stages of Concern questionnaire) along with multiple sources (the researcher's perceptions and teachers' perceptions).

		Stages of Concern	Characteristics
	6	*Refocusing*	I have some ideas that would work even better
IMPACT	5	*Collaboration*	I am concerned about relating what I am doing with what my co-workers are doing
	4	*Consequences*	How is my use of the initiative affecting my students
TASK	3	*Management*	I seem to be spending all of my time getting materials ready
SELF	2	*Personal*	How will using the initiative affect me
	1	*Informational*	I would like to know more about the initiative
	0	*Awareness*	I am not concerned about the initiative

Figure 18. Stages of Concern about the Initiative.

Note. Adapted from *Implementing Change: Patterns, Principles, and Potholes* (p. 61) by G. E. Hall & S. M. Hord, 2001, Boston: Allyn and Bacon. Copyright 2001 by Pearson Education. Reprinted with Permission of the publisher.

The Stages of Concern model and questionnaire have been used to measure the needs and concerns of individual adopters in a wide range of initiative implementations. Its broad acceptance has prompted at least two empirical studies testing the reliability and validity of both the questionnaire and the hierarchical framework of concerns itself (see Bailey & Palsha, 1992; Shotsberger & Crawford, 1996). The results of these studies have supported the broad assumptions of the overall model framework (Bailey & Palsha, 1992) but propose reducing the number of stages from seven down to five because of reliability concerns involving the stages of *Informational* and *Refocusing* (Shotsberger & Crawford, 1996). Essentially, the results of both studies provide statistical support in the instruments inability to reliably distinguish *Informational* concerns from *Awareness* and

Personal concerns and *Refocusing* concerns from those of *Collaboration* (Bailey & Palsha, 1992; Shotsberger & Crawford, 1996). In addition, each study develops and tests an alternate questionnaire featuring fewer questions producing the same results as the original 35-question instrument. To address these reliability issues, this study categorized teacher's concerns into the broader classification of (1) concerns for *Self*; (2) concerns about the *Task*; and (3) concerns for the *Impact* on students as depicted in Figure 18. In addition, the reduction of questions in the instrument was inconsequential given the minimal time required to complete the original 35-question questionnaire.

Describing school culture.

In order to address the research question asking how the school culture influences teacher's attitudes, beliefs, and concerns regarding the mathematics curriculum initiatives and their implementation, the researcher used extensive field notes during the data collection period to both describe and measure the attributes of school culture. Data was obtained from informal observations of the school's staff and leadership. The researcher used the broad framework of describing school culture provided by Hargreaves (1994) as a preliminary framework to assist the collection of data.

As discussed in the review of literature, Hargreaves (1994) states that a school's culture is comprised of two elements: (1) the *form of the culture* and (2) the *content of the culture*. Hargreaves numerates the forms of the culture to include (1) fragmented individualism, (2) balkanization, (3) collaborative culture, (4) contrived collegiality, and (5) the moving mosaic. (See Figure 7 on p. 40). Each form influences the individual's ability and willingness to adapt to new circumstances. Intermixed with the form of the culture is what Hargreaves describes as the *content of the culture*. The content of the school culture consists of shared norms and the set of attitudes, values, beliefs, assumptions, and traditional ways of doing things in the school. Hargreaves' definition falls short of providing a preliminary framework for the measurement of *content of the culture*. Therefore, Hargreaves' model will be supplemented in this area with the work of Saphier and King. Within the realm of the content of school culture, the participant observer used Saphier and King's (1985) *12 Norms of School Culture* as a guideline. An integrated framework incorporating Hargreaves' Model and Saphier and Kings' norms can be found in Appendix D.

The data of school culture was triangulated by employing the multiple collection procedures and sources. The participant observer's perception of the school culture will cross-validate the data collected from informal interviews with the school staff. The researcher will use the framework provided by Hargreaves and Saphier and King to develop questions to prime the informal discussions with the school staff.

Describing school leadership.

A research question in this study questions how leadership influences teacher's attitudes, beliefs, and concerns regarding curriculum initiatives. The data collection procedure to describe and measure leadership factors with the school followed the same design as described for the collection of data on school culture. Both observations and interviews of teachers and school leaders conducted by the participant observer served to triangulate the information. The framework used to gather observation data and interviews in the area of leadership was the *Framework for Leadership* provide by Fullan (2001a) (see Appendix E).

Fullan's framework, developed from a compilation of "theories, knowledge bases, ideas, and strategies," (p. 3) consists of five components of leadership encompassed by the personal characteristic he describes as the *energy-enthusiasm-hopefulness constellation*. The first component of Fullan's leadership framework is what he calls *Moral Purpose,* which is characterized by a leadership consistently making decisions and intending to affect the school and its inhabitants in a positive manner. *Understanding the Change Process* includes an appreciation and ability to handle the complex process in order to sustain meaningful improvement in the school. The building of positive *Relationships* marks the third element of the framework. The relationships provide for a sense of worth and ownership among the school community. *Knowledge Creation and Sharing* underscores the importance of working collegially and exploring new ideas to improve the school. The final element of the framework is what Fullan describes as *Coherence Making* where the leader continuously strives to focus the school during the complex change process while at the same time, continuing to encourage them to pursue new improvement ideas.

Fullan states that the interaction of these elements, coupled with the personal characteristic constellation, can facilitate the change process in an educational setting. The researcher used the six elements of this framework (the five components along with the characteristic constellation) to describe and assess school leadership. Appendix E contains Fullan's framework.

Measuring implementation levels of mathematics curriculum initiatives.

In order to determine the influence of teacher's attitudes, beliefs, and concerns on their implementation of the mathematics curriculum initiatives, the researcher needed to assess the degree to which each individual teacher has implemented the initiatives. Again, informal observation and interviews were used as the primary collection procedures. Using multiple procedures facilitates the triangulation of the data by permitting the participant observer to compare behaviors witnessed through observations with information gathered from teacher interviews. This cross-validation allowed the researcher to reconcile differences between an individual's espoused classroom implementation level and their actual actions (Patton, 1997). As a framework for the observations and interviews, the design utilized another component of the CBAM developed specifically to describe degrees of implementation of educational initiatives.

The *Levels of Use* framework is a qualitative observation and interview instrument originally developed by the Research and Development Center for Teacher Education at the University of Texas at Austin (Loucks, Newlove, & Hall, 1998). The framework enumerates eight different levels of implementation demonstrated by individuals during the process of incorporating new practices into their existing behaviors. The Levels of Use framework differs from the Stages of Concern in that the stages "address the *affective* side of change – people's reactions, feelings, perceptions, and attitudes – *Levels of Use* has to do with *behaviors* and portrays *how* people are acting with respect to a specified change [italics in original]" (Hall & Hord, 2001, p. 81).

Figure 19 illustrates the hierarchical nature of the *Levels of Use* framework. The framework describes the first three levels as (1) nonuse, (2) orientation, and (3) preparation. These levels indicate the teacher is currently a *Nonuser* of the initiative and has yet to change his/her practices and implement the idea. The *Nonuser* levels precede the five levels of *Users* ranging from *Mechanical Use* where the teacher demonstrates "disjointed and superficial use" (Loucks, et al., p. 8) to the most advanced level of *Renewal* marked by full integration of the initiative along with adaptation improving the impact on students (Hall & Hord, 2001).

The training documentation for the instrument includes a branching interview diagram that assisted researchers in identifying the proper Levels of Use. An in-depth narrative explanation of each level is presented in Appendix F.

		Levels of Use	**Characteristics**
	VI	*Renewal*	Full integration with adaptation to increase impact.
	V	*Integration*	Teachers collaborate with others to adapt the initiative.
Users	IVB	*Refinement*	Improvement attempts focused on student impact begin to emerge.
	IVA	*Routine*	Implementation is stabilized. Little thought about improvement or consequences.
	III	*Mechanical Use*	Disjointed and superficial day-to-day use. Adaptation to assist teacher not students.
	II	*Preparation*	Preparing to implement the initiative.
Nonusers	I	*Orientation*	Acquired information and exploring value of initiative.
	0	*Nonuse*	Little knowledge or involvement with the initiative.

Figure 19. Levels of Use of the Initiative.

Note. Adapted from *Implementing Change: Patterns, Principles, and Potholes* (p. 82) by G. E. Hall & S. M. Hord, 2001, Boston: Allyn and Bacon. Copyright 2001 by Pearson Education. Reprinted with Permission of the publisher.

Measuring student achievement.

The final area measured in this study was that of student achievement. Two of the research questions contend that there are patterns involving teacher's attitudes, beliefs, and concerns about the curriculum initiative, their implementation of those initiatives and student achievement. As discussed in the literature review, student performance on a standardized state assessment was used to measure achievement. The collection of this data was from publicly available district and school information along with compilations of student scores associated with each teacher participating in the study. Student performance scores were separated from any student identification information at the time of data collection and compilation. Only composite school and teacher PSSA score information – not individual student scores – were used in this study.

The Commonwealth of Pennsylvania implements the student assessment provisions of NCLB using a series of standardized assessments in Reading and Math. Pedulla et al. (2003) define different types of test-driven accountability systems based on the level of the consequences of the testing and the impact of different groups of stakeholders. Often test-driven accountability systems hold schools, teachers and students accountable at differing levels, the categories delineated by Pedulla et al. are: (1) high stakes for schools/teachers and high stakes for students; (2) high stakes for schools/teachers and moderate stakes for students; (3) high stakes for schools/teachers and low stakes for students; (4) moderate stakes for schools/teachers and high stakes for students; and (5) moderate stakes for schools/teachers and low stakes for students. Pedulla defines the Commonwealth of Pennsylvania as a high/moderate accountability state because of the sanction placed on schools for failing to meet the student performance benchmark and the lack of promotion and graduation exit testing requirements for students.

The Pennsylvania System of School Assessment (PSSA) in Mathematics is administered each April to all third, fifth, eighth and eleventh grade students in public school throughout the Commonwealth. The Pennsylvania Department of Education (PDE) recently conducted a validity and reliability study on the PSSA. (see Thacker, Dickinson & Koger, 2004) Validity was tested by comparing student results on the PSSA to results of other common standardized assessments. Thacker, Dickinson, and Koger (2004) found strong evidence that student PSSA scores correlated positively to the (1) Terra Nova, (2) California Assessment Test, version 5 (CAT-5), (3) Northwest Evaluation Association (NWEA), and (4) New Standards Reference Exam (NSRE). Thacker et al. also found the mathematics portion of the PSSA to have a reliability coefficient greater than 0.9. The PDE is presently working to implement the recommendations of the study to improve the assessment.

Data Analysis Procedures

Unlike many data analysis procedures that occur after the data collection period, the data analysis in ethnographic research occurs simultaneously with data collection. Fetterman (1989) describes the process stating "an ethnographer is a human instrument and must discriminate among types of data and analyze the relative worth of one path over another at every turn of fieldwork…analysis is an ongoing responsibility" (p. 13). Miles and Huberman (1994) depict a qualitative data analysis *Flow Model* (see Figure 20) illustrating a multiple phase process. Data analysis actually begins prior to the formal collection of data "as the researcher decides (often without full awareness) which conceptual framework, which cases, which research questions, and which data collection approaches to choose" (p. 10). During the data collection phase, the researcher refines the data in what is described as analytic cycle (Jorgensen, 1989). The process entails the (1) continuous reduction of the data; (2) organization, assembly and display of data; (3) formation and verification of conclusions (Miles & Huberman, 1994). This same process continues after the data collection period has ended without the ability to return to the field to test the conclusions reached by the analysis. Due to the emergent naturalistic characteristics of qualitative research, data analysis procedures are preliminary in nature and often evolve during the study (Marshall & Rossman, 1999).

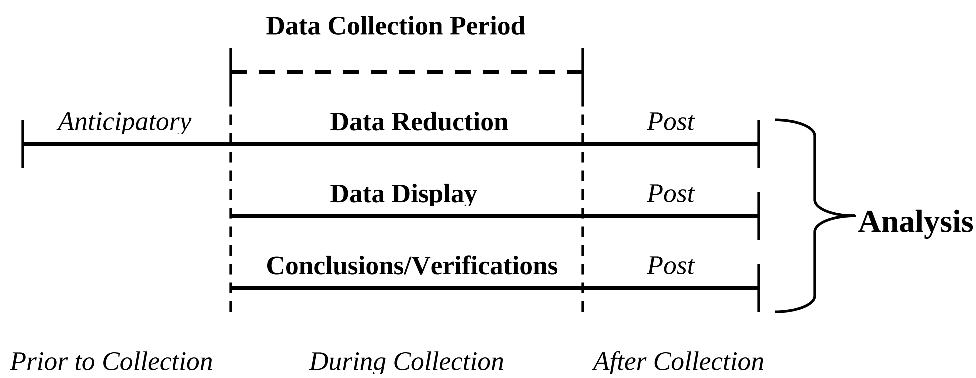


Figure 20. Data Analysis Flow Model.

Note. *Adapted from Qualitative Data Analysis, 2nd Ed.* (p. 10) by M. B. Miles & A. M. Huberman, 1994, Thousand Oaks: CA, Sage Publication. Copyright 1992 by M. B. Miles and A. M. Huberman. Reprinted with Permission of the publisher.

Anticipatory Analysis

The anticipatory data analysis was presented in the data collection section of this chapter. From the outset of data collection, the analysis of (1) teacher's attitudes, beliefs, and concerns; (2) school culture; (3) school leadership; and (4) degree of implementation of the curriculum initiative was broadly defined by the frameworks provided in Appendix B through Appendix G.

Analysis During Data Collection

During the data collection stage of the research, a significant portion of the data analysis was also conducted. Marshall & Rossman (1999) expand on Miles and Huberman's (1994) three components in this area by numerating six phases of qualitative data analysis: (1) organizing the data; (2) generating themes and patterns; (3) coding field notes; (4) testing preliminary themes and patterns; (5) looking for other explanations; and (6) producing writing reports. Maxwell (1996) identifies a common "problem in qualitative studies as letting… unanalyzed field notes and transcripts pile up, making the task of final analysis much more difficult" (p. 77). To avoid this problem, the participant observer's voice field notes were transcribed into digital text format and organized and coded into categories and subcategories each day during the data collection period. Wiersma (2000) describes this process as *categorization*; the first step of qualitative data analysis. Initial category codes and subcodes reflect the frameworks established for each of the areas of measurement as presented in the data collection section of this chapter. A preliminary list of these codes may be found in Appendix I. In addition, the preliminary description and synthesis of this data was organized into narratives, charts, and matrices in order to provide the researcher with a broader view of the analysis (Fetterman, 1989; Marshall & Rossman, 1999; Miles & Huberman, 1994). The ATLAS.ti Visual Qualitative Data Analysis software was used to facilitate this process.

Simultaneous to the above mentioned data reduction procedures, the analysis began to identify common patterns and themes in the data related to the study's five research questions. Fetterman (1989) describes the process as ethnographic researchers continuously adjust their focus from microanalysis to macro-analysis then back again.

> Ethnographers see patterns of thought and action repeat in various situations and with various players. Looking for patterns is a form of analysis. The ethnographer begins with a mass of undifferentiated ideas and behavior, and then collects pieces of information, comparing, contrasting, and sorting gross categories and minutiae until a discernible thought or behavior becomes identifiable. Next the ethnographer must listen and observe, and then compare his or her observations with this poorly defined model. Exceptions to the rule emerge, variations on a theme are detectable. These variants help to circumscribe the activity and clarify its meaning. The process requires further sifting and sorting to make a match between categories. The theme finally emerges. (Fetterman, 1989, p. 92)

The identification of these patterns and themes is fundamental to ethnographic research as new question and analysis procedures emerge over time during the study (Freebody, 2003). Patton (2002) explains this process of *inductive content analysis* as "discovering patterns, themes, and categories in one's data" (p. 453). This process was ongoing throughout the three-month data collection period as the participant observer looked for these relationships between (1) school culture; (2) leadership; (3) teacher's attitudes, beliefs, and concerns; and (4) implementation level.

Post Data Collection Analysis

Quantitative Analysis of Stages of Concern Questionnaire Data

First, the *Stages of Concern* questionnaire was analyzed in accordance with the scoring manual (Hall, George, & Rutherford, 1998) and individual teacher concern profiles were developed as depicted in Figure 21. These profiles were compared with the teacher's concern profiles developed from the informal observations and interviews in order to confirm the accuracy of qualitative data analysis that occurred during the data collection process.

After individual teacher's concern profiles were developed, they were combined to produce a composite school profile. Hall et al. recommend developing a frequency table indicating the number of individual teachers whose profile has a peak at any particular stage. This was done for each of the four middle schools participating in the study. The frequency table illustrated not only themes of common teacher concerns in a school but also the range and differences among them. These composite school profiles were used in the larger qualitative analysis to determine themes and patterns among these profiles, school culture, leadership, and student achievement.

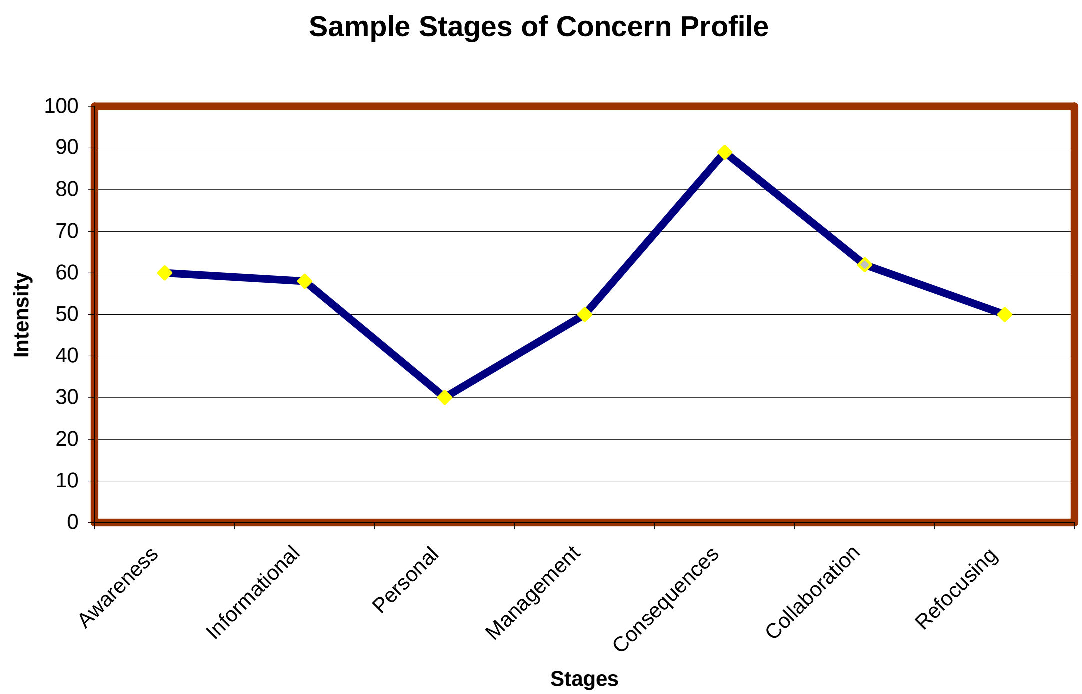


Figure 21. Sample Stages of Concern Profile.

Quantitative Analysis of Student PSSA Score Data

The district and school compilations of student performance on the Grade 8 Math PSSA are reported publicly along with individual student scores being reported to both schools and parents. Student performance levels are reported to schools and parents as numerical scaled scores ranging from 0 to 2500 then reorganized into the broader categories of (1) advanced, (2) proficient, (3) basic, and (4) below basic to comply with NCLB public reporting requirements as illustrated in Table 6. It is the number of students in these broader categories along with changes in population means and distribution that was used for comparison in this study. The quantity of students at each PSSA proficiency level from the year prior to the curriculum initiatives was collected then compared to those from the year following the adoption of the initiatives. These compilations of student proficiency levels were assembled for each of the four schools in the study along with each of the teachers participating in the study. These compilations along with other notable changes between the two years were used in casual comparison with the teacher's concerns, school culture and leadership data collected in the study.

Table 6

Synthesis of PSSA Scaled Scores and Performance Level Categories

Scaled Score	Level	Performance Level Descriptors
1510 - 2300	Advanced	This level reflects superior academic performance. Advanced work indicates an in-depth understanding and exemplary display of the skills included in the Pennsylvania Academic Content Standards.
1300 - 1509	Proficient	This level reflects satisfactory academic performance. Proficient work indicates a solid understanding and adequate display of the skills included in the Pennsylvania Academic Content Standards.
1180 – 1299	Basic	This level reflects marginal academic performance. Basic work indicates a partial understanding and limited display of the skills included in the Pennsylvania Academic Content Standards. This work is approaching satisfactory performance, but has not yet reached it. There is a need for additional instructional opportunities and/or increased student academic commitment to achieve the proficient level.
0 – 1179	Below Basic	This level reflects inadequate academic performance. Below Basic work indicates little understanding and minimal display of the skill included in the Pennsylvania Academic Content Standards. There is a major need for additional instructional opportunities and/or increased student academic commitment to achieve the Proficient Level.

Note. *Adapted from Performance Level Handbook.* (p. 11) by Pennsylvania Department of Education & Pennsylvania Association of Intermediate Units, 2002, Harrisburg: PA.

Qualitative Data Analysis

Once the quantitative data analysis was completed, the analysis moved to a more confirmatory stage as the data implications on the study's research questions were examined. The analysis took on a more holistic perspective as the research tested the conceptual framework in this study. Patton (2002) describes this as a deduction analysis because data was compared to an existing framework. This progress from inductive analysis to deductive analysis is not uncommon in qualitative research as "once patterns, themes, and/or categories have been established through inductive analysis, the final confirmatory stage of qualitative analysis may be deductive in testing and affirming the authenticity and appropriateness of the inductive content analysis" (Patton, 2002, p. 454). Marshall and Rossman (1999) describe these final steps in qualitative analysis as "testing emergent understandings" and "searching for alternative explanations" (p. 157). Figure 22 contains an overview of the entire data analysis process including areas of comparisons to be examined for broader patterns and themes in order to address the specific research questions identified in this study.

Finally, in accordance with one of the cornerstones of qualitative research, the analysis examined the above-mentioned relationships from a more holistic view. The holistic analysis looked at the whole system as a complex interaction "that is more than the sum of its parts," (Patton, 2002, p. 41) attempting to validate the study's conceptual framework involving the interrelatedness of (1) school culture; (2) leadership; (3) teacher's attitudes, beliefs, and concerns; (4) implementation level; and (5) student achievement.

Area of Measurement	Anticipatory Analysis	During Collection Analysis	Post Collection Analysis	Holistic Analysis
Research Question #1: How did teacher's attitudes, beliefs, and concerns about test-driven accountability relate to the implementation of mathematics curriculum initiatives?				
Teacher's Concerns	Stages of Concern Framework	Generate Categories and Coding	Develop Individual Concerns Profiles	Identify Patterns and Themes and Search for Alternate Explanations
Implementation Levels	Levels of Use Framework	Generate Categories and Coding	Develop Individual Levels of Use Profile	
Research Question #2: How did a teacher's implementation of mathematics curriculum initiatives relate to student achievement on state assessments?				
Implementation Level	Levels of Use Framework	Generate Categories and Coding	Develop Individual Levels of Use Profile	Identify Patterns and Themes and Search for Alternate Explanations
Student Achievement	None	None	Compile Pre and Post PSSA Scores for each Teacher	
Research Question #3: How did teacher's attitudes, beliefs, and concerns about test-driven accountability relate to student achievement on state assessment?				
Teacher's Concerns	Stages of Concern Framework	Generate Categories and Coding	Develop Composite School Concerns Profiles	Identify Patterns and Themes and Search for Alternate Explanations
Student Achievement	None	None	Compile Pre and Post PSSA Scores for each School	
Research Question #4: What was the influence of principal and curriculum leadership's influence on teachers' attitudes, beliefs, and concerns?				
Leadership	Fullan's Framework of Leadership	Generate Categories and Coding	Develop Composite School Leadership Profiles	Identify Patterns and Themes and Search for Alternate Explanations
Teacher's Concerns	Stages of Concern Framework	Generate Categories and Coding	Develop Composite School Concerns Profiles	
Research Question # 5: What was the influence of school culture on teachers' attitudes, beliefs, and concerns?				
School Culture	Hargreaves' Form & Content Integrated Framework	Generate Categories and Coding	Develop School Culture Profile	Identify Patterns and Themes and Search for Alternate Explanations
Teacher's Concerns	Stages of Concern Framework	Generate Categories and Coding	Develop Composite School Concerns Profiles	

Figure 22. Overview of data analysis process related to each research question.

Summary

This chapter described the mixed methods methodology of a study designed to discover and explain the influence of a number of contextual factors on the implementation of mathematics curriculum initiatives and student achievement. Rationale was provided in support of the ethnographic approach using the researcher as a participant observer to explore the complex, context-dependent process of program implementation along with the selection of the four middle schools in a suburban Philadelphia School District.

Data collection procedures involved informal observations, informal interviews, and a questionnaire of eighth grade mathematics teachers over a period of three months. General frameworks for the assessment of (1) school culture, (2) leadership, (3) implementation levels, and (4) teacher's attitudes, beliefs, and concerns were described and included in the appendices. The chapter closed with a presentation of the study's preliminary data analysis plan, which included the identification and explanation of patterns and themes related to the study's five research questions. An overview of the data collection and analysis procedures can be found in Appendix A and Appendix K respectively.

CHAPTER FOUR: DATA ANALYSIS AND FINDINGS

The purpose of this study was to explore themes and patterns that emerge during the process of implementation of mathematics curriculum initiatives in the context of today's test-driven accountability environment. Specifically, the study investigated relationships between the contextual factors of school culture; teacher's attitudes, beliefs, and concerns; and leadership as they are related to the implementation of mathematics curriculum initiatives and student achievement in a test-driven accountability environment.

The mathematics curriculum initiatives under investigation include: (1) providing additional instruction to academically at-risk students during an Instructional Opportunity Period (IOP); (2) providing in-classroom instructional support to teachers of mathematics; and (3) providing additional resource materials designed to focus teachers' instructional practices. District level curriculum initiatives such as these frequently fail during their implementation, in part, due to interrelated factors within the organizational context of the school, such as leadership, school culture and individual teacher's values and beliefs. (Sarason, 1990). The lack of understanding of how these contextual factors are related to each other and to the implementation of curriculum initiatives presents a significant barrier to changing instructional practice in the classroom.

The broad focus of this study examined the relationships between the implementation of mathematics curriculum initiatives; student achievement on state assessments; school culture; school leadership; and teacher's attitudes, beliefs, and concerns about test-driven accountability. The interrelatedness of these factors resulted in several sub-questions:

1. How did teacher's attitudes, beliefs, and concerns about test-driven accountability relate to the implementation of mathematics curriculum initiatives?
2. How did a teacher's implementation of mathematics curriculum initiatives relate to student achievement of state assessments?
3. How did teacher's attitudes, beliefs, and concerns about test-driven accountability relate to student achievement on state assessment?
4. What was the influence of principal and curriculum leadership on teachers' attitudes, beliefs, and concerns?
5. What was the influence of school culture on teachers' attitudes, beliefs, and concerns?

After a brief overview of the process used to collect and analyze the data over a 26-week period, the findings of each of these research questions will be presented. The findings of each research question will be discussed by first stating generalizations in patterns identified in the data, followed by the presentation of summary information in support of those generalizations. The discussion will continue by citing specific evidence from the researcher's field notes during the data collection period to support the summary information.

Implementation of the Research Design in the Study

The data collection period ran parallel to data analysis as an integral part of the ethnography methodology described in the previous chapter. This concurrent process allowed the researcher to adjust the focus of the data collection as new patterns and themes emerged in the data (Fetterman, 1989; Freebody, 2003; Jorgensen, 1989; Miles & Huberman, 1994; Patten, 2002). The implementation of the research design progressed through a number of different phases. The first 10 weeks of data collection was spent exclusively gathering, identifying, categorizing, and analyzing quantitative data in the form of state assessment scores from 2004 and 2005. Once this component was completed, the next 12 weeks were used to gather and analyze teacher questionnaire responses and the qualitative interview and observation data as described in the research design of the study. Additional data reduction and analysis continued for four weeks beyond the 22-week data collection period as recommended by Miles and Huberman (1994) resulting in the findings displayed in the various tables throughout this chapter.

Data Collection – Phase I: Collection and Analysis of State Assessment Data

Two of the five research questions involved examining themes and patterns on how teacher's attitudes, beliefs, and concerns and implementation of the Mathematics Curriculum Initiatives influenced state assessment scores from 2004 to 2005. Prior to investigating any patterns of influence on assessment scores, assessment score data was analyzed to identify any significant changes from 2004 to 2005 in similar groupings of students.

The analysis process began by attributing each student score to the teacher responsible for the mathematics instruction of that student. Additionally, student assessment scores were classified in one of three categories based on the type of math class they took during their eighth grade year. These categories included: (1) Students in an Accelerated Math Class; (2) Students in a Traditional Math Class; and (3) Students with Individual Educational Plans. The process of attributing the individual student scores to teachers and classifying them by category of the math instruction was accomplished by examining individual student schedules and report cards for 807 eighth-grade students from 2004 and 852 students in 2005. Once the attribution and classification process was complete, student names and other demographic information was deleted to maintain confidentiality.

The first level of analysis examined overall assessment score changes in the entire school's eighth grade population from 2004 to 2005. The descriptive analysis was done by using a Box and Whisker Plot provided online by St. John's University (http://www.physics.csbsju.edu/stats/KS-test.html). This analysis produced mean, median, ranges and general data distribution information. Since the assessment scores in 2004 and 2005 are from different cohorts of students, a second descriptive analysis was used to examine significant changes in the distribution of the data sets. A Kolmogorov-Smirnov (KS) Distribution Test was used to determine if the 2004 and 2005 data sets differ significantly. The online analysis produced a graphic empirical distribution function displaying changes in the distribution of scores and identified a point of maximum distribution change from one year to the next. Additionally, the KS Distribution analysis provided a P value quantifying the confidence level to which any changes in the distribution may be caused by normal fluctuations in the data sets instead of the Mathematic Curriculum Initiatives. As customary in educational research, the Level of Significance was set at 0.05 for determining whether the difference from one year to the next was statistically significant. Table 7 summarizes the results of both descriptive analyses; more specific school results including data analysis breakdowns by category of Math Class of each school are provided in Appendix Q through S.

Since the research design called for the examination of how a teacher's implementation of the Mathematics Curriculum Initiatives influenced assessment scores of their students, the overall school data had to be further broken down. First, the overall student population attributed to each teacher was analyzed for significant changes from 2004 to 2005. Each teacher population was further separated into the aforementioned Math Class Categories of (1) Students in Accelerated Math Classes; (2) Students in Traditional Math Classes; and (3) Students with Individual Education Plans. The process of grouping students by teacher and then by type of math class resulted in 13 groups of student assessment scores that were the direct focus of the implementation of the Mathematics Curriculum Initiatives in 2005. These 13 groups from 2005 were compared to similar student groupings identified by having the same teacher and type of math class from the previous year's state assessment using descriptive statistical analysis of student scores. A summary of the analysis of these 13 groups will be discussed in subsequent sections as they relate to specific research questions. Specific results of the analysis of each teacher group can be found in Appendices T through W.

Table 7

Changes in Overall School State Assessment Scores

Schools	Change in Mean Score	Change in Percent scoring Proficient or above	Maximum Change in Distribution at any point	Confidence Interval 0.05 Level of Significance
School A	+ 22 Points	+ 5 %	+ 12%	P = 0.128
School B	+ 25 Points	+ 12 %	+ 12 %	P = 0.032
School C	+ 51 Points	+ 10 %	+ 23 %	P = 0.000
School D	+ 90 Points	+ 20 %	+ 23 %	P = 0.000

Data Collection – Phase II: Questionnaire Data

The second part of data collection began with the distribution of the invitations to participate in the study to 16 teachers and 20 school leaders involved in the mathematics curriculum initiatives. The letter of invitation (see Appendix M) was the only contact made by the researcher to solicit volunteers for the study. As a result, 13 teachers and 13 school leaders agreed to participate in the research study and completed the approved Informed Consent Form (See Appendix N).

As per the research design, each teacher involved in the study was asked to complete the 35-question *Stages of Concern Questionnaire*. Each teacher's Stages of Concern Questionnaire was scored and a graphic *Concerns Profile* was developed in accordance with the procedures established in the *Measuring Stages of Concern about the Innovation: A manual for Use of the SOC Questionnaire* (Hall, George, & Rutherford, 1998). To facilitate the scoring of the questionnaire, the researcher developed an Excel spreadsheet that automatically scored the questionnaire and generated a graphic concerns profile given the individual question responses. The Stages of Concern Questionnaire can be found in Appendix C. In addition, each individual teacher's *Concerns Profile* can be found in Appendix P.

Data Collection – Phase III: Interview and Observation Field Note Data

Once teacher participants completed the Stages of Concern Questionnaire, the informal observations and interview data collection began and continued for approximately 12 weeks. As per the study's ethnographic research design, qualitative data was gathered in a non-obtrusive, naturalistic manner as the researcher interacted with participants during the course of the normal job function. To facilitate field-noting process, the researcher used a Panasonic RR-US360 Digital Voice Recorder to document observations and discussions over the course of each school visit. As part of the naturalistic design, participants were not recorded; only the researcher's observations and recollection of the conversations with participants were documented. Over the course of the data collection period, the researcher made 108 visits to the four participating schools ranging in duration from one hour to 8 hours in length. During these visits, nearly 500 field notes were recorded ranging in duration from 10 seconds to one minute in length. Table 8 contains informational collection data on each school involved in the study.

Table 8
Participation and Data Collection Statistics

School	Teachers Participating	Leaders Participating	2004 Student PSSA Scores	2005 Student PSSA Scores	Visits to Schools	Field Note Entries
School A	3	3	180	194	26	106
School B	4	5	282	297	30	119
School C	3	3	177	185	25	156
School D	3	2	168	176	27	103
Totals	13	13	807	852	108	484

Data Reduction and Coding

Concurrent to the data collection process mentioned in the previous section, preliminary data reduction and coding was performed. In order to ensure the security and confidentiality of the digital field notes, the digital files were downloaded from the voice recorder to a secure desktop computer offsite on a daily basis. Each field note was attributed to the appropriate school and category of data, then transcribed from digital voice recordings into text for coding. The transcribed field notes were then organized into primary documents based on the type of data in the field notes. Each teacher and school leader had a primary document containing all the field notes pertaining to him or her, as did each school for field notes related to school/team culture. These primary documents were continuously updated, as additional data was collected over the course of the data collection period.

Data Analysis

To manage the large quantity of qualitative data collected for this study, the ATLASTi visual qualitative data analysis software was utilized. Each primary document was loaded into ATLASTi along with the preliminary data coding scaffolding found in Appendix I. Data reduction and analysis began by coding each individual field note entry in the primary documents. The function of the coding was to facilitate the development of summary profiles in the areas of: (1) teacher implementation levels of the mathematics curriculum initiatives; (2) teacher's attitudes, beliefs, and concerns; (3) school leadership; and (4) school culture. Specific quotations in the field notes were identified as they related to the coding system. During the process, the coding system was expanded as new information and categories of data were collected. Conjectures and connections within the data were noted via ATLASTi's memo system. Table 9 and Table 10 contain frequency information of entries in the ATLASTi software.

Table 9

ATLASTi Software Data Analysis Statistics

ATLASTi Elements	Primary Documents	Codes	Memos	Quotes
Quantity	48	218	176	1059

Table 10

Data Collection - Field Note Statistics

Participant Category	Informal Observations	Informal Interviews	Totals
Teacher's Attitudes, Beliefs, and Concerns and Implementation Levels	54	116	170
Leaders	86	114	200
School/Team/Grade Culture	142	0	142
Totals	282	230	512

The information presented in the subsequent tables in this chapter is the product of this data reduction process facilitated by the software's ability to identify, track, and count the specific codes associated with each primary document. The summary profile information in the aforementioned areas along with changes in assessment results was used in the broader analysis to identify patterns and themes related to the study's five research questions.

Reliability and Validity Issues

Validity issues were addressed in the research design of the study by establishing multiple sources of data and multiple methods of gathering that same data. This triangulation of information fosters the validity of information gathered on (1) leadership, (2) school culture, (3) implementation, and (4) teacher's attitudes, beliefs, and concerns. Due to the uniqueness of the individuals and school environments involved in this ethnographic study, the findings may not be widely generalized to other settings. However, these same facets of the research design enhance the internal validity of the findings. An underlying theme of qualitative research permits the researcher to continuously check and recheck the validity of the data, observations, and findings by shifting the focus and questioning during the data collection period to ensure the study is assessing what it is supposed to assess. This process of *Inductive Content Analysis* (Patton, 2002) allows emerged themes to surface and these new themes to be validated with additional probes to identify potential alternative explanations during data collection.

Additionally, the researcher, as participant observer, began the immersion into the different school settings 12 months prior to the data collection period permitting a more in-depth understanding of the contextual factor under investigation. Merriam and Associates (2002) underscore the significance of the depth of immersion by pointing out that the closer the researcher is to the participant's reality, the better the validity of the data stating "…internal validity is considered a strength of qualitative research" (p. 25).

The PSSA data analysis of changes from 2004 to 2005 for each school and teacher participating in the study can easily be replicated using the PSSA Score data set found in Appendices Q through W. While replication of the interview and observation data collection is not possible, reliability of this data was promoted by the consistency of the data coding, reduction and analysis facilitated by the ATLASTi visual data analysis software. In order to facilitate the consistency of the data reduction and analysis, the research design established preliminary frameworks to be used as a starting point for coding in the areas of (1) teacher's attitudes, beliefs, and concerns; (2) implementation; (3) leadership; and (4) school culture. These coding frameworks can be found in Appendices B through F.

Also contributing to the reliability of the findings was the 12-week duration of the data collection window. This period of time permitted the researcher to refine observation and interview skills over a period of three months instead of relying on one-shot probes into the school contextual setting. Moreover, the ATLASTi software archived what Merriam and Associates (2002) describe as an *Audit Trail* of over 170 different memos, ideas, conjectures, and reflections of the researcher providing a detailed account of the data collection and analysis process. Inherent limitations of the ethnographic research design will be addressed in the following chapter.

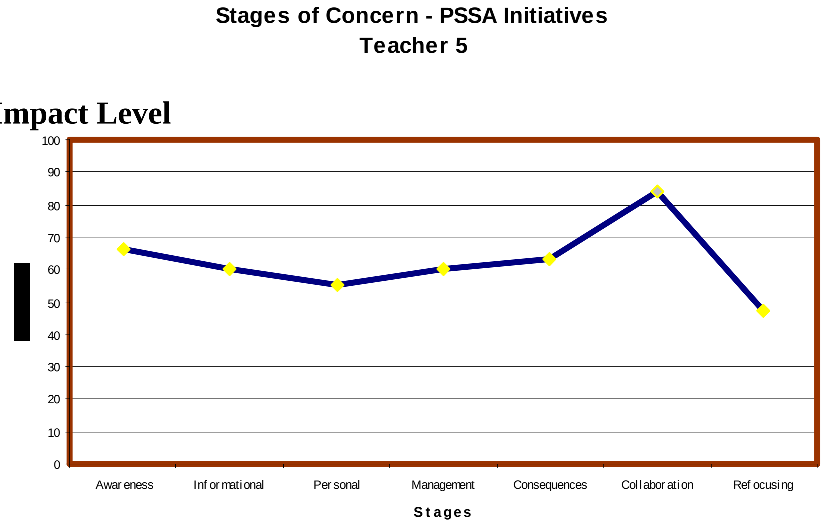
Findings Related to Each Research Question

Research Question 1: How did teacher's attitudes, beliefs, and concerns about test-driven accountability relate to the implementation of mathematics curriculum initiatives?

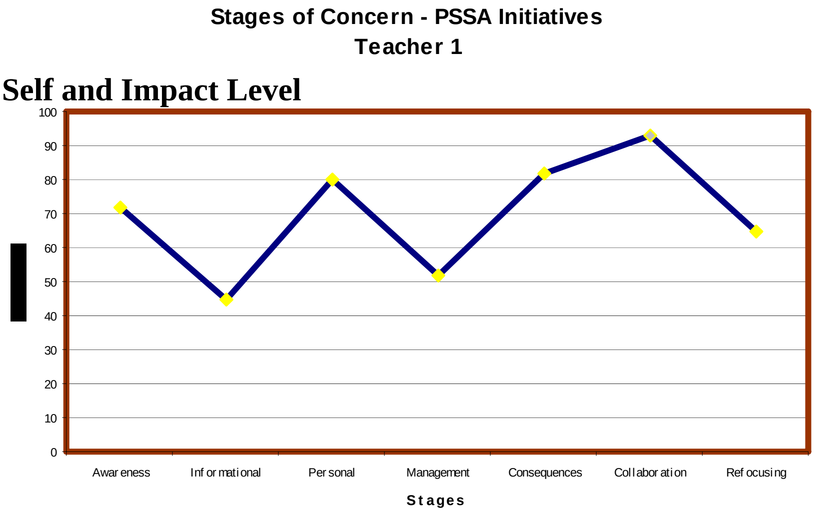
The first research question examined patterns and themes in the relation between teacher's attitudes, beliefs, and concerns about test-driven accountability initiatives and their implementation of the initiatives. In general, teachers with a single peak at the *Impact Level* in their Stages of Concern Profile had a higher level of implementation of the Mathematics Curriculum Initiatives as demonstrated by increased instructional time, greater involvement, and more classroom integration. Teachers with a double peak Stages of Concern Profile at both *Self and Impact Levels* demonstrated a more moderate level of implementation while those teachers with only *Self Level* Concerns had lower levels of implementation.

Table 11 represents a reduction of individual teacher's Stages of Concern Profiles and the Implementation Data to illustrate the relationship between the two sets of data. The Stages of Concern Profiles of the 13 teachers participating in the study are grouped into three broad categories: (1) Teachers with a Single Peak at the Impact Stage of Concern; (2) Teachers with a Double Peak at Impact Stage and the Self Stage of Concern; and (3) Teachers with a Single Peak at the Self Stage of Concern. A representative sample of each type of Concern Profile is shown in Figure 23. Each individual teacher's Stages of Concern profile may be found in Appendix P.

Category I
Single Peak at Impact Level



Category II
Double Peak at Self and Impact Level



Category III
Single Peak at Self Level

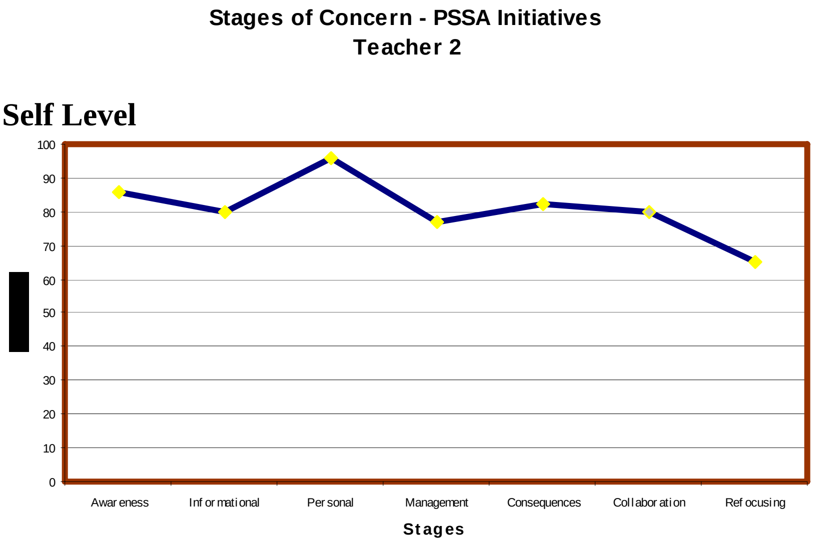
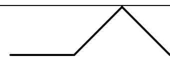
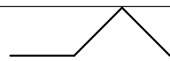
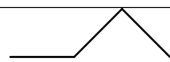
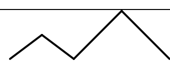
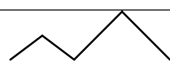
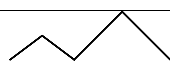
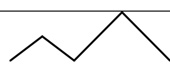
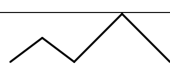
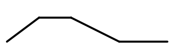
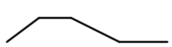
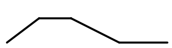
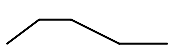


Figure 23. Representative Samples of Common Teacher Concern Profiles.

Table 11

Comparison of Teacher’s Concern Profiles and Implementation Levels.

CATEGORY I **Teachers with Single Peak at Impact Level of Concern**				
Teacher’s Concerns		**Implementation**		
	SOC Profile	**Area I** *IOP Restructuring*	**Area II** *IOP Involvement*	**Area III** *Classroom Usage*
Teacher 5		Yes – Routine with Refinements	Yes - Routine	Yes - Integrated
Teacher 9		Yes – Routine with Refinements	Yes – Routine	Yes - Refinement
Teacher 13		Yes – Routine	Yes – Routine	Yes - Integrated
CATEGORY II **Teachers with Double Peak at Impact and Self Level Concerns**				
Teacher’s Concerns		**Implementation**		
	SOC Profile	**Area I** *IOP Restructuring*	**Area II** *IOP Involvement*	**Area III** *Classroom Usage*
Teacher 1		Yes	No	Yes - Routine
Teacher 3		N/A	N/A	Yes - Mechanical
Teacher 6		Yes – Routine	Yes – Routine	Yes - Mechanical
Teacher 7		No	Yes – Pick & Choose	No
Teacher 10		Yes	N/A	Yes - Mechanical
Teacher 16		No	N/A	Yes – Pick & Choose
CATEGORY III **Teachers with Single Peak at Self Level Concerns**				
Teacher’s Concerns		**Implementation**		
	SOC Profile	**Area I** *IOP Restructuring*	**Area II** *IOP Involvement*	**Area III** *Classroom Usage*
Teacher 2		Yes	No	Yes - Mechanical
Teacher 8		No	No	Yes – Pick & Choose
Teacher 12		No	N/A	No
Teacher 14		Yes	N/A	No

Each teacher's implementation of the Mathematics Curriculum Initiatives is broken down into the three areas of implementation defined in the previous chapter. Implementation Area I - *IOP Restructuring* - indicates the degree to which the teacher restructured their team's IOP period to provide additional math instruction to academically at-risk students. Implementation Area II - *IOP Involvement* - indicates the teacher's level of participation in the delivery of the additional math instruction during the restructured IOP. The third area of implementation described as *Regular Classroom Usage* measures the extent to which the teacher transferred the information and materials used during their IOP classes to their instructional practice in their regular math classes. Based on interview and observational data, each of the three areas of implementation was measured using the *Level of Use* scaffolding defined in the previous chapter. An overview of the Level of Use scaffolding used to measure each area of implementation is illustrated in Figure 24. A more detailed description of the scaffolding may be found in Appendix F.

		Levels of Use	Characteristics
	VI	*Renewal*	Full integration with adaptation to increase impact.
	V	*Integration*	Teachers collaborate with others to adapt the initiative.
Users	IVB	*Refinement*	Improvement attempts focused on student impact begin to emerge.
	IVA	*Routine*	Implementation is stabilized. Little thought about improvement or consequences.
	III	*Mechanical Use*	Disjointed and superficial day-to-day use. Adaptation to assist teacher not students.
	II	*Preparation*	Preparing to implement the initiative.
Nonusers	I	*Orientation*	Acquired information and exploring value of initiative.
	0	*Nonuse*	Little knowledge or involvement with the initiative.

Figure 24. Levels of Use of the Initiative.

Note. Adapted from *Implementing Change: Patterns, Principles, and Potholes* (p. 82) by G. E. Hall & S. M. Hord, 2001, Boston: Allyn and Bacon. Copyright 2001 by Pearson Education. Reprinted with Permission of the publisher

Category I*: *Teachers with a single peak at the Impact Leve.

The three teachers with a single peak at the Impact level – either Consequences or Collaboration Stages – demonstrated a more advanced Level of Use in three areas of implementation. Hall et al. (1998) describe this type of *Concerns Profile* as those "heavily concerned about working with her/his colleagues…in coordinating the use of the innovation…typical of team leaders and many administrators" (p. 40). The teachers in this category developed an intricate restructuring model of their teams' IOP classes in order to provide the opportunity for the Mathematics Curriculum Initiatives to be used with academically at-risk students. Not only did these teachers facilitate the restructuring of the IOP time but they were also directly involved with the delivery of instruction during this same period of time. An implementation level in all three areas was determined using interview and observational data.

The implementation level of each teacher regarding Area I – *IOP Restructuring for more Instructional Time* – can be substantiated, in part, by the following excerpts from the researcher's field notes.

Researcher's Field Notes of Conversation with Teacher 5:

> XX-XX-05 Discussion with Teacher reflecting on MCI during IOP last year. Identified academically at-risk kids on their team; those kids got 3 days of extra math and 3 days of extra reading during the Middle School cycle; focused on students with IEP. Used Math Coach extensively. This design required that [he/she] taught math 6 of 6 days during IOP. Cooperation among teachers on team.

Researcher's Field Notes of Conversation with Teacher 9:

> XX-XX-05 Discussion/Reflection with Teacher on the implementation of last year. Began in November. At-risk kids regrouped based on need. I saw lowest/most difficult group; teacher 9 saw the other group. At times, we merged classes [team taught both groups]. Kids in need got 1 period per 6 days from November through April.

Researcher’s Field Notes of Conversation with Teacher 13:

> XX-XX-05 Discussion/Reflection with Teacher about last year's implementation. Regrouped entire IOP period based on Math ability. Math Coach saw 2 groups, each 1 of 6 days. Teacher saw 2 IEP groups; each 1 of 6 days. Significant restructuring; similar to Teacher 9 and Teacher 5.

Teachers in Category I – Single Peak Impact Concerns – also exhibited higher levels of involvement in the delivery of the additional mathematics instruction. The following excerpts from the researcher’s field notes regarding Implementation Area II typified the behavior demonstrated by teachers in Category I.

Researcher’s Field Notes of Observation of Teacher 5:

> XX-XX-05 Teacher 5 always asks what more [he/she] can do. Consistently uses Math Coach during IOP class. Works with Math Coach during class. Does not fear the collaboration/working together issue that may be a barrier for other teachers.

Researcher’s Field Notes of observation of Teacher 13:

> XX-XX-05 Teacher 13 has a "PSSA Cart" including PSSA books, calculators, formulas sheets that [he/she] used during IOP classes. Teacher voluntarily traveled [to a different room] last year during IOP so Math Coach could use [his/her] classroom.

The third area of implementation that set Category I teachers apart was their high-level integration of the Mathematics Curriculum Initiative materials outside of the IOP time during their regular math classes. Each of these three teachers willingly and systematically integrated the initiatives to other students outside the immediate focus of the initiative. Furthermore, teachers with a moderate to high level of regular classroom usage of the Mathematics Curriculum Initiatives had a greater frequency of interactions with the Math Coach/Researcher as indicated by the quantity of field notes recorded regarding each teacher.

The following select excerpts from the researcher's field notes support the findings regarding Implementation Area III – Regular Classroom Usage and illustrate typical behaviors indicating a high level of regular classroom integration.

Researcher's Field Notes of observation and discussion with Teacher 13:

> XX-XX-05 Discussion with teacher about specific content and strategies on open-ended questions; concerned about understanding testing procedures; clearly SOC at Collaboration; Implementation is High; definite User…[He/She] has a great repository of questions in [his/her] filing cabinet of questions; able to pull them out and has used many of them with classes.
>
> XX-XX-05 Observation: Teacher uses PSSA Scrap Paper Format with students as part of the learning process; not just during the actual Assessment.

Researcher’s Field Notes of discussions with Teacher 9:

> XX-XX-05 Discussion with Teacher of one particular MCI. In reference to questions on the Open-ended question process; particularly the rough draft. [He/She] does not think it is necessary; does not use it; "it takes too much time."

> XX-XX-05 Discussion with Teacher about the specifics of OE questions. How [he/she] is happy the Math Coach lesson coincides with what is going on in [his/her] regular classes. Likes the idea of reducing the instruction down to one-step, simpler problems first. Makes it manageable/doable for the kids. Using OE question format in Regular Classes and implemented the MCI OE Design.

Researcher’s Field Notes of observations and discussions with Teacher 5:

> XX-XX-05   Observation: Teacher has the MCI Key Phrases laminated and posted around the Classroom.

> XX-XX-05 Brief Discussion about today’s IOP class. Things are ready to go; plenty of material. [The MCI] Seem to now be part of [his/her] regular day's activities.

> XX-XX-05 Discussion with Teacher about use of "Verbalization" technique during Regular Math Class. Believes it may help with the Open-Ended What/Why format.

Summarizing the Implementation Levels of teachers in Category I with Single Peak Impact Concerns Profiles, these teachers (1) focused on the Mathematics

Curriculum Initiatives more often during their 6-day middle rotation; (2) were more involved in presenting the additional instruction during IOP classes; and (3) were more likely to incorporate the materials into their regular math classes than those teachers with different Stages of Concern Profiles.

Category II: Teachers with dual concern peaks at the Self and Impact Level.

Teachers with dual peaks in their Concerns profile were somewhat less involved with the implementation of the Math Curriculum Initiatives during their IOP class while demonstrating a more mechanical usage of the initiatives during their regular math classes. Hall et al. (1998) describe this type of *Concerns Profile* as individuals "looking for ideas from others, reflecting more a desire to learn from what others know and are doing" (p. 54). The lack of involvement in three of the six teachers in this cluster was not necessarily the result of teacher choice but instead curtailed by school scheduling constraints. These teachers were assigned other grade level classes during the period when their students were scheduled for IOP classes. Teacher 3, teacher 10, and teacher 16 could not be involved in the delivery of the additional mathematics instruction during IOP class because of these scheduling constraints. Teachers in this cluster interacted with the Math Coach/researcher less frequently than teachers in the previous cluster who exhibited only Impact Level concerns.

Of the remaining teachers, 2 of the 3 teachers made voluntary choices not to become fully involved with delivering the Mathematics Curriculum Initiatives during IOP classes focusing instead on other priorities. Findings in these areas are supported by the following field notes and typify the lack of restructuring and involvement by teachers in Category II.

Researcher's Field Notes of observation of Teacher 7:

> XX-XX-05 Observation/reflections on teacher's use of MCI last year. NO IEP kids in that IOP class; also only 2 teachers for 35 kids during IOP. No real structure or plan. No identification; all students were included for whatever the plan was. More of a fun environment. Implementation was not as extensive as other teachers.

Researcher's Field Notes discussions with Teacher 1:

> XX-XX-05 Discussion/Reflection on last year's implementation level. Teacher had [another professional responsibility] 2 of 6 days during IOP class. No structured/organized MCI implementation during remaining IOP classes. Did however use MCI resources to supplement regular Math classes. Results: At-risk kids got only 1 period per 6 days from Math Coach.

As noted in the above quotation, Teacher 1 demonstrated a more routine use of the Mathematics Curriculum Initiative material during her regular math classes than did the other teachers in this cluster. The field note reflected little or superficial transfer of the material to regular classes by the other five teachers.

Teacher 6 is the exception to the pattern in that his Concern profile matched the other teachers in this double peak cluster yet his implementation levels more closely match those teachers in the previous cluster with single peak Impact Level Concerns. A potential explanation for the variation in the pattern may be related to the aversion to the Math Coach Co-Teaching Component of the Mathematics Curriculum Initiatives expressed by this teacher. Below are two excerpts from the researcher's field notes in related discussions with Teacher 6 about using the Math Coach to assist his instructional efforts during the IOP class.

Researcher's Field Notes of discussions with Teacher 6:

> XX-XX-05 Discussion with Teacher: Offered services/support of Math Coach with the 4/5 SpEd students [he/she] sees on a rotating basis during IOP. "No; not really interested" Would like me to keep giving [him/her] "stuff" to use during those classes.
>
> XX-XX-05 Teacher Quote, "I don't need your support" Not said in a negative way, just saying [he/she] can do it [himself/herself].

Category III: Teachers with a single peak at the Self Level

The final cluster of teachers with only elevated Self Concerns demonstrated little if any involvement in the implementation and usage of the Mathematics Curriculum Initiatives. Hall et al. (1998) describe this type of *Concerns Profile* as a "typical nonuser profile" (p. 36) where individuals do not yet have enough information to implement the initiative or have strong feelings about how the initiative may affect them personally. Teacher 2, Teacher 8, and Teacher 14 all had elevated Refocusing Stages of Concern indicating a potential disagreement with the initiatives under investigation (Hall et al., 1998). Their minimal implementation of the Mathematics Curriculum Initiatives can be documented by the absence of data collected on their use of materials associated with the initiative. While interview data was minimal for this cluster of teachers due to their lack of voluntary interaction with the Math Coach/Researcher, observational data illustrated a more detailed account of their involvement in the delivery of the additional mathematics instruction during their classes. In each case, teachers in this cluster with elevated Self Concerns seem somewhat more disinterested in the initiatives and preoccupied with other tasks. Below are select excerpts from the researcher's observation field notes on teachers in this cluster.

Researcher's Field Notes of observation of Teacher 2, Teacher 8 and Teacher 12:

> XX-XX-05 Observation: During Math Coach presentation to [his/her] class, teacher remains at desk doing work uninvolved with the lesson. Does not even look up during the lesson; does not participate. As if the class was taken over and [he/she] no longer had any responsibility.
>
> XX-XX-05 Observation: Teacher leaves classroom as Math Coach presents lesson to [his/her] students. Not the first time this has happened.
>
> XX-XX-05 Observation: Teacher again leaves Math Coach lesson to take care of a broken [xxx] system in the building. Teacher runs the school's [other professional responsibility].
>
> XX-XX-05 Observation: During Math Coach presentation to IOP class, teacher sits at desk to do substitute plans for the next day. Wasn't feeling well; need to get them done; did get up and down to help on occasion but used most of the class to get [his/her] work done. Focused on [his/her] needs.
>
> XX-XX-05 Observation: No meaningful PSSA interaction; no questions asked; almost for the entire data collection period.

In summarizing how teacher's attitudes, beliefs, and concerns about test-driven accountability affect their implementation of mathematics curriculum initiatives, the findings presented in this section identify three categories of teacher Stages of Concern profiles: (1) Teachers with a Single Peak at the Impact Stage of Concern; (2) Teachers with a Double Peak at Impact Stage and the Self Stage of Concern; and (3) Teachers with a Single Peak at the Self Stage of Concern. These three categories of Stages of Concern profiles are associated with common patterns in teacher implementation levels in three different areas of implementation of the Mathematics Curriculum Initiatives. The three areas of implementation included: (1) *IOP Restructuring* for increased mathematics instructional time; (2) the *Teachers Involvement* during the IOP Instruction; and (3) the incorporation of the ideas and materials into their *Regular Math Classes*.

Teachers with single peak Impact Stage Concerns have higher implementation levels than do teachers with double peak Self and Impact Stages of Concern. Teachers with single peak Self Stage Concerns exhibit only minimal implementation of the Mathematics Curriculum Initiatives. The findings in this area are consistent with previous research indicating teacher's attitudes, beliefs, and concerns about an initiative influence their implementation of the initiative (e.g., Hall & Hord, 2001; Rogers, 1995) underscoring the significance of addressing individual teacher needs in future school improvement initiatives. Further discussion and implications of these findings will be presented in Chapter 5.

Research Question 2: How did a teacher's implementation of mathematics curriculum initiatives relate to student achievement on state assessments?

Research Question 2 extends the first research question to student achievement by examining how a teacher's implementation level of the Mathematics Curriculum Initiatives affected their students' results on the state math assessment. Patterns in the findings indicate that groups of students who received additional mathematical instructional periods during their IOP class – Implementation Area I - showed significant increases in their PSSA Scores when compared to similar groups the previous year. Moreover, when the additional math instruction was combined with high levels of teacher involvement during both the IOP classes and the integration of materials into the regular math classroom – Implementation Areas II & III - student achievement gains were even greater than those groups just receiving additional instruction from a third party teacher.

Table 12 compares changes in state assessment scores of 13 different student groups with the associated teachers' implementation level. Changes in assessment scores for each group from 2004 to 2005 were analyzed as described previously in this chapter separating student scores into those students in a traditional, non-accelerated math course and students who have an Individual Education Plan (IEP). The scores of those students in accelerated math courses were not included as these students were not the focus of the Mathematics Curriculum Initiatives under investigation in this study.

Student groups are organized into three broad categories based on the Implementation Level of the teacher(s) associated with that particular group. The first cluster consists of five groups that received one period of additional math instruction from the Math Coach with minimal teacher involvement. Four of these groups demonstrated an increase in the mean scaled score of traditional student groups ranging from 30 points to 100 points compared to similar groupings of students the previous year. Moreover, each of the four groups indicated a change in the percentage of students who scored at the Proficient and Advanced Levels ranging from increases of 6 percent to 24 percent.

The second cluster consists of four student groups who received a minimum of one additional instructional period with both high levels of teacher involvement during IOP and regular math classroom usage. Each of these groups demonstrated significant increases in both mean scaled scores and percentage of students scoring at the Proficient and Advanced Levels when compared to similar groups from the previous year’s state assessment results. In each case, the gains in both areas were greater than the increases noted in the previous category where additional instruction was provided but teachers were less involved in the initiative.

The third cluster of student groups consists of those groups that were not exposed to additional math instruction. In the two groups that did not receive additional instructional time and the teachers demonstrated low levels of involvement and regular classroom usage, state assessment scores decreased from 2004 to 2005. In addition, P values on the KS distribution test for these two groups were higher than most values for the student groups in the previous clusters and outside the 95% Confidence Interval. The remaining two student groups, while not receiving additional math instruction during their IOP class, were associated with teachers with moderate to high level of regular classroom usage. Both of these groups showed small increases in both the mean scaled scores and percentage of students scoring at the Proficient and Advanced Levels.

Table 12 presents an overview of the analysis of changes in state assessment scores from 2004 to 2005. More details of the analysis of each group can be found in Appendices R through U. Additionally, the implementation information presented in Table 12 represents a summary of observation and interview data collected on each teacher's implementation level of the Mathematics Curriculum Initiatives as supported by the researcher's field notes. This Implementation Level information is the same information presented in Table 11 comparing Stages of Concern Profiles to Implementation Level, therefore specific evidence detailing teachers' implementation levels will not be reiterated again in this section.

Summarizing the findings on how teacher's implementation of the mathematics curriculum initiatives affected student achievement on the state mathematics assessment, groups of students who received additional mathematics instruction as a result of the Mathematics Curriculum Initiative demonstrated increases in the state assessment scores as compared to similar groupings of students from the previous year. Moreover, when this additional instructional time was combined with high levels of teacher involvement during IOP class and regular classroom integration of initiative materials, state assessment scores demonstrated larger increases. The patterns in these findings are consistent with the existing evidence that additional standards-based instruction can improve student achievement (e.g., Blair & Resnick, 2000). In addition, the findings seem to indicate that the level of implementation may have significant impact on student achievement. Further discussion and implications of these findings will be presented in the next chapter.

Table 12
Comparison of Implementation Levels and Assessment Scores

CLUSTER I Groups receiving One Additional Instructional Period from Math Coach Only and Minimal Teacher Involvement								
		Implementation Areas			**Change in Assessment Scores**			
Student Group	**Associated Teacher(s)**	**IOP Restructured for Additional Instruction**	**Teacher's IOP Involvement**	**Regular Classroom Usage**	**Non-accelerated Students**		**IEP Students**	**Confidence Level 0.05** Level of Significance
Student Group 1	Teacher 1	1 Period in 6 Days	Math Coach Only	Routine	Average Score	+70	N/A	P=0.107 Max Change 27%
					Proficient or Above	+20%	N/A	
Student Group 2	Teacher 2	1 Period in 6 Days	Math Coach Only	Mechanical	Average Score	+30	N/A	P=0.326 Max Change 22%
					Proficient or Above	+6%	N/A	
Student Group 3	Teacher 3	1 Period in 6 Days	Math Coach Only	Mechanical	Average Score	+/- 0	N/A	Small group P=0.99
					Proficient or Above	+/- 0%	N/A	
Student Group 9	Teacher 10	1 Period in 6 Days	Math Coach Only	Unclear	Average Score	+100	N/A	P=0.001 Max Change 40%
					Proficient or Above	+24%	N/A	
Student Group 12	Teacher 14	1 Period in 6 Days	Math Coach Only	Non-User	Average Score	+50	N/A	P=0.048 Max Change 25%
					Proficient or Above	+15%	N/A	

Table 12 - Continued
Comparison of Implementation Levels and Assessment Scores

CLUSTER II Groups receiving Additional Instructional Period from Math Coach with High Teacher Involvement									
		Implementation Areas			**Change in Assessment Scores**				
Student Group	**Associated Teacher(s)**	**IOP Restructured for Additional Instruction**	**Teacher's IOP Involvement**	**Regular Classroom Usage**	**Non-accelerated Students**		**IEP Students**		**Confidence Level** **0.05** **Level of Significance**
Student Group 7	Teacher 5 Teacher 6 Teacher 8	2/3 Periods in 6 Days	Math Coach & Teacher 5&6	Integratioin Mechanical Non-User	N/A		Average Score	+70	P=0.002 Max Change 45%
					N/A		Proficient or Above	+30%	
Student Group 8	Teacher 9	1 Period in 6 Days	Math Coach & Teacher 9	Refinement	Average Score	+110	Average Score	+150	P=0.000 Max Change 43%
					Proficient or Above	+27%	Proficient or Above	+35%	
Student Group 11	Teacher 13	1 Period in 6 Days	Math Coach & Teacher 13	Integration	Average Score	+100	NA		P=0.099 Max Change 35%
					Proficient or Above	+29%	NA		
Student Group 13	Teacher 16	1 Period in 6 Days	Math Coach & Teacher 13	Mechanical	N/A		Average Score	+80	P=0.004 Max Change 49%
					N/A		Proficient or Above	+14 %	

Table 12 - Continued
Comparison of Implementation Levels and Assessment Scores

CLUSTER III
Groups receiving No Additional Instructional Periods and Minimal Teacher Implementation

		Implementation Areas			**Change in Assessment Scores**				
Student Group	**Associated Teacher(s)**	**IOP Restructured for Additional Instruction**	**Teacher's IOP Involvement**	**Regular Classroom Usage**	**Non-accelerated Students**		**IEP Students**		**Confidence Level** **0.05** **Level of Significance**
Student Group 6	Teacher 7	?? Periods in 6 Days	Teacher Only	Non-User	Average Score	-30	NA		P=0.368 Max Change -24%
					Proficient or Above	-8%	NA		
Student Group 10	Teacher 12	0 Periods in 6 Days	None	Non-User	NA		Average Score	-30	Population Increased 50% P=0.475 Max Change -28%
					NA		Proficient or Above	-11%	
Student Group 6	Teacher 5	?? Periods in 6 Days	Math Coach & Teacher	Refinement	Average Score	+15	NA		Small Number of Group received additional instruction P=0.263 Max Change 18%
					Proficient or Above	+6%	NA		
Student Group 4	Teacher 6	1 Period in 6 days	Science Teacher	Mechanical	Average Score	+18	NA		Students in Group received additional instruction from science teacher P=0.013 Max Change 29%
					Proficient or Above	+13%	NA		

Research Question 3: How did teacher's attitudes, beliefs, and concerns about test-driven accountability relate to student achievement on state assessment?

Research Question 3 investigated how teachers' attitudes, beliefs, and concerns about test-driven accountability affected student achievement on the state assessment. However, instead of examining the influences at the *individual* teacher level, the study focused on the analysis of the broader *school level* changes in PSSA results involving the entire student population and a *composite* teacher Concern Profile of the participating teachers in that school. Due to the highly individual nature of the teacher's attitudes beliefs and concerns and the limited number of teacher's Stages of Concern profiles available in each school, no overall pattern or themes could be found in the school level composite Stages of Concern profiles. As a result, comparison of composite teachers Stages of Concerns to overall changes in assessment scores from 2004 and 2005 was not possible.

Table 13 illustrated the teachers associated with each school and peaks in their individual Stages of Concern profiles in addition to overall changes in the assessment scores from the previous year. While each school demonstrated significant increases in overall student performance in both mean scaled score and the number of students scoring at the Proficient and Advanced Levels, these changes could not be associated with overall patterns and themes in the school's composite Stages of Concern profile.

The findings in this area brings into question the merit of developing composite Stages of Concern profiles along with the potential for further investigation into influences of individual teacher's Stages of Concern on their students' assessment scores. While a relationship between teacher's attitudes, beliefs, and concerns and student performance on the state mathematics assessment is possible, the student groupings examined in this study received mathematics instruction from more than one teacher; as a result, a one-to-one relationship could not be established. These topics will be discussed further in the next chapter.

Table 13

Comparison of School Composite Stages of Concern and Overall School Changes in Assessment Scores from 2004 to 2005

School	Teachers	Teacher SOC Peaks	Change in State Assessment Scores 0.05 Level of Significance		
School A	Teacher 1 Teacher 2 Teacher 3	Self & Impact Self Self & Impact	Average Score	+22	P=0.128 Max Change 12%
			Proficient or Above	+5%	
School B	Teacher 5 Teacher 6 Teacher 7 Teacher 8	Impact Self & Impact Self & Impact Self & Management	Average Score	+25	P=0.032 Max Change 12%
			Proficient or Above	+12%	
School C	Teacher 9 Teacher 10 Teacher 12	Impact Self & Impact Self	Average Score	+51	P=0.000 Max Change 23%
			Proficient or Above	+10%	
School D	Teacher 13 Teacher 14 Teacher 16	Impact Self & Refocusing Self & Impact	Average Score	+90	P=0.000 Max Change 23%
			Proficient or Above	+20%	

Research Question 4 and Research Question 5: What was the influence of principal and curriculum leadership on teachers' attitudes, beliefs, and concerns? What was the influence of school culture on teachers' attitudes, beliefs, and concerns?

The remaining research questions examined influences on the teacher's attitudes, beliefs, and concerns related to school leadership and culture. While the research design poses separate questions on the effects of school leadership and school culture on teacher's attitudes, beliefs, and concerns, the data indicates that the influences of these factors may be intertwined and not easily distinguished. Existing literature indicates that school culture is influenced by school leadership and conversely school leadership by school culture (e.g., Deal & Peterson, 1999). For this reason, the findings in the area of school leadership and school culture will be presented together in this section.

As stated previously, due to the individual nature of teacher's attitudes, beliefs, and concerns about the mathematics curriculum initiatives related to test-driven accountability and the small number of participants in each school, it was difficult to develop a composite Stages of Concern profile for each school. Moreover, findings in the area of school culture indicate that a school's culture may vary based on different categories of activities undertaken by the school. When the analysis focused specifically on the instructional culture of each school, observational data indicates that all schools in the study demonstrated substantial *Balkanization* (Hargreaves, 1994) of the school culture into smaller subcultures revolving around middle school teams and grade levels. As a result of these factors, school leadership and school culture seem to have less influence on teacher's attitudes, beliefs, and concerns than did the form and content of the subculture and leadership elements within that subculture to which the teacher belonged. Furthermore, the findings indicate that the availability of time may have a greater influence on teacher's attitudes, beliefs, and concerns and implementation of the Mathematics Curriculum Initiative than leadership and school culture.

Multiple forms of school culture

Findings in the area of school culture and leadership are complex. The study loosely defines school culture similar to Body (1992) to include the systems of relationships and shared norms, attitudes, and beliefs within a school. The analysis of observational data gathered on overall school culture attempted to classify each of the participating school's cultures as one of the five Forms of Culture described in the research design (See Appendix D) by Hargreaves (1994).

Post-analysis of the data indicates that each school in the study may have multiple Forms of Culture depending on the focus of the analysis. The activities of a school and its staff are broad including (1) instructional activities, (2) logistical planning, (3) community service programs, (4) charity work, and (5) student social events. The findings indicate that different Forms of School Culture may exist for different activities of the school and its staff; that is, a school that exhibits a Collaborative Form of Culture when it comes to community service programs may demonstrate a balkanized Form of Culture in the area of instructional activities. For this reason, analysis of school culture was separated into the broad categories of Instructional Culture and Non-Instructional Culture.

Evidence of different cultures in the same school: Instructional and non-instructional.

Different Forms of School Culture based on instructional and non-instructional activities are evident in each school. These differences will be discussed using School C as this school clearly illustrated the contrast observed between instructional and non-instructional activities. Observation data on the overall school culture of School C was coded as to indicate a mix between what Hargreaves (1994) describes as Moving Mosaic and a True Collaborative Culture. ATLASTi codes indicated 14 references to these two Forms of Culture in the school. These initial classifications did not distinguish between instructional and non-instructional activities. Upon further analysis, practically all data pointing to these two forms of cultures in School C involved non-instructional activities. Data involving instructional activities and an overall school culture was minimal but when evident, pointed to a Balkanization (Hargreaves, 1994) of the school into Middle School Teams when it came to more traditional educational issues such as instructional design and student achievement. Continuing to use School C as an example, the following excerpts from the researcher's observation field notes, reflections, and Memos in the ATLASTi software illustrates the multiple cultures described above.

The findings in this area are supported by researcher field notes as School C demonstrated the following *Moving Mosaic* and *Collaborative* Forms of School Culture (Hargreaves, 1994) while involved in non-instructional activities.

Researcher's Field Notes from observation of Culture in School C:

> XX-XX-05 Observation: A number of staff members, students and administrators are outside first period video taping skit involving... what looks like a Hoe Down for the Morning Announcement that people seem to enjoy watching.

> XX-XX-05 Observation: The Commercial/Skit being video taped last week finally aired. It is the kids/staff singing a vitamin song to the theme

of "Old McDonald" The entire school watched the broadcast; unlike normal morning announcements.

XX-XX-05 Observation: Hanging around the building are photographs of each staff member with a "milk mustache" with a cute little quotation in support of a anti-scoliosis drink milk campaign. Somehow connected to the H&PE department; almost all staff members appear in a photo somewhere in the school.

XX-XX-05 Observation: At 7:15 am, Staff is preparing for a morning announcements video recording. Apparently, members of staff are dressing up as the "Fruit of the Loom" characters in support of a nutritious eating campaign. Part of some grant involving "Healthy Eating."

XX-XX-05 Discussion with teacher about the nutrition campaign. [He/She] likes to stay away from it. Apparently, Principal wrote a grant to get money to support Nutrition. Moved from milk to fruit to vegetable: Standing in front of me are two male teachers dressed in black tights with the Fruit of the Loom costumes on. (one grapes, one strawberry) Principal initiated; to get grant and to get staff to support. At least one staff member likes to avoid the comical parts. Another initiative within the school getting more support/priority/attention than the MCI.

XX-XX-05 Observation/Reflection: The dance is a Senior Prom for senior citizens in the community. “Been doing it for years.” Retirement Communities attend; Shriners Clowns are present.

XX-XX-05 Observation: School buys into "Red Ribbon Week" for Drug Awareness. Hall Monitors are giving out candy to students wearing red ribbons. Red ribbons across the entrance way to the school; on handrail on step; on trees; light poles; banners outside; school statue mascot has red ribbon around one leg and big red ribbon around his neck.

XX-XX-05 Observation on Monthly Staff Luncheon: In library, tables/table cloths/ cardboard pillars/ candles/ light dimmed. Prep Time is significant; Art Department's month; kids deliver art work to the library.

XX-XX-05 Observation: Staff photograph in the Gym of what appears to be the entire staff sitting on bleachers with their "Milk Mustaches." Photo is prominently displayed in the lobby of the school.

XX-XX-05 Observation/Reflection: Entire school attended the Shriner's Circus. Apparently, they were given tickets to the circus by the Shriner's Clowns who were invited to the school annual "Senior Prom." The Shriners were so impressed by the Senior Prom they offered the tickets.

Information via Leader C3

Reflection: Getting an entire staff/school to do anything is a huge logistical and motivational task.

XX-XX-05 Observation/Reflection on Inservice Options. School took a "Historic Walking Tour" of the community in lieu of other options like School B, which addressed MCI/RCI for the year.

As indicated by these excerpts from the researcher's field notes, School C clearly demonstrates a highly motivated, collaborative non-instructional school culture. School B exhibited similar characteristics involving its non-instructional school culture whereas School A and School D were somewhat less coherent and collaborative in their non-instructional cultures.

However, evidence of these same collaborative characteristics surrounding instructional topics is not apparent in the data; instead, the data indicates more divisions in each school in this area. Again, researcher field notes from School C are used as an example to support the findings in this area.

Researcher's Field Notes from observation of Culture in School C:

> XX-XX-05 Teacher makes a point to inform me that [his/her] team (with Teacher 9) has developed their version of the MCI/RCI IOP model.. "I might want to share it with others" Thinks it is the best.
>
> XX-XX-05 Observation: Team dispute at lower grade level about MCI/RCI expansion between Regular Ed and SpEd Staff. Coordination; asking all to do more; but some are not willing. First observed conflict in school. This is the same team that Leader C2 emailed me to help with; Leader C4 intervened with.
>
> XX-XX-05 Another discussion with Teacher/Leader. Agitated; Frustrated with Staff member for being negative about some RCI initiatives. Presently an obstacle to the initiatives. Explained how [he/she] "dealt" with them in a forthright meaning; settling them down;

not clear to the extent the staff accepted those explanations. School Culture issues here.

XX-XX-05 Discussion with a number of staff on expansion of MCI during IOP. Met obstacle as far as change and some entrenched pet program. Attitude that they are doing it well now; why change. Do not want to change it.

XX-XX-05 Discussion with Teacher on expansion of MCI: Quote, "We'll probably just do what we want to do" in lieu of the additional 40 days of math instruction. Clearly, work within their own team needed (not necessarily personal needed but also kids' needs); work on their own; minimal influence from the outside/difficult to influence. Long standing team of teachers.

The above examples provide evidence to illustrate the autonomy and individual nature of the middle school team subculture apparent to the researcher in each of the schools when instructional activities were involved. The evidence implies that the Form of School Culture (Hargreaves, 1994) may vary contingent upon the type of activities being undertaken by a school and/or teachers. Both School B and School C have more cooperatives, collaborative, and responsive School Cultures when undertaking non-instructional tasks such as (1) student social activities; (2) charity fundraising activities; and (3) student awareness initiatives. Yet their Form of School Culture when associated with instructional activities such as lesson design and student achievement takes on a more *Balkanized Form* (Hargreaves, 1994) where Individual Team/Grade Level

Subcultures seemed to be the dominant influence on teachers. As presented in the following section, evidence also seems to indicate that the *Form* of the Team/Grade Level Subculture may play a more significant role in influencing Teacher's Attitudes, Beliefs, and Concerns than that of the overall school culture.

Personal Concerns related to school culture and leadership

While each school exhibited somewhat different Forms of non-instructional culture, all demonstrated *Balkanization* (Hargreaves, 1994) of their instructional cultures into individual middle school teams. Furthermore, each Team/Grade Level subculture, exhibited its own Form of instructional culture varying from *Collaborative* to *Fragmented Individualism* (Hargreaves, 1994). Relationships in the Form of the Team Subcultures and Leadership to Teacher's Stages of Concern profiles will be examined next in Table 14.

Given the above evidence of instructional culture *Balkanization* (Hargreaves, 1994) in each school, further analysis sought to identify the *Form* of each subculture to which teachers in the study belonged. Table 14 compares each teacher's Personal Stage Score from their Stages of Concern Profile to leadership attributes of both subculture and the overall school along with the form of subculture to which the teacher belongs. Teachers indicating a lower Personal Concern score were, for the most part, members of the team/grade level subcultures that demonstrated a collaborative form of interaction. Additionally, a component of each of these team/grade level subcultures was an individual who was highly involved and in support of Mathematics Curriculum Initiatives. The existence of this type of unofficial team/grade level leadership may be able to overcome the lack of overall school instructional leadership as indicated by teacher 9, teacher 16, and teacher 13. The teachers with lower Personal Stage Concerns are the same teachers discussed previously as having Single Peak Impact Concerns

Conversely, the combination of the lack of leadership and a team subculture characterized by fragmentation was associated with exhibiting higher scores in the Personal Stage of Concern. The six teachers with the highest Personal Stage scores were members of middle school teams characterized by fragmented individualism due to either personal characteristics of the members of that team or scheduling restrictions preventing the group of teachers from functioning as a true team. The teachers in this group are those discussed previously with either Single Peak Self Concerns or Double Peak Self and Impact Concerns.

In the following sections, discussion and evidence substantiating the information displayed in Table 14 will be presented. First, the discussion will contrast the difference between schools that demonstrated initiative related leadership with schools that exhibited less leadership involving the Mathematics Curriculum Initiatives in the context of Fullan's Leadership Framework (see Appendix E). The framework included the components described by Fullan (2001a) as (1) Moral Purpose; (2) Understanding the Change Process; (3) Relationship Building; (4) Knowledge Creation and Sharing; (5) Coherence Making; and (6) a Constellation of Energy, Enthusiasm, and Hope. While Fullan's Framework served as a foundation for data collection, additional components of school leadership were added during the process to clarify Fullan's broader components. After contrasting the initiative related leadership found in the school, the discussion will focus the *Knowledge Creation and Sharing* component of Fullan's Framework as observations and interview data identified significant differences in school leadership in this area.

Table 14

Comparison of Teacher's Personal Concerns with Leadership and Team Culture

Teacher	Teacher's SOC "Personal" Stage Score	Initiative related Team/Grade Leadership	Form of Team Subculture	Initiative related School Leadership
Teacher 2	Personal=95	Minimal	Fragmented Individualism	Minimal
Teacher 12	Personal=88	Non-Member	Fragmented Individualism	Minimal
Teacher 10	Personal=85	Minimal	Partial Team Fragmented Minimal Interaction	Minimal
Teacher 1	Personal=80	Minimal	Fragmented Individualism	Minimal
Teacher 3	Personal=80	Minimal	Partial Team Fragmented Minimal Interaction	Minimal
Teacher 14	Personal=78	None	Partial Team Fragmented Minimal Interaction	Minimal
Teacher 6	Personal=70	Highly Involved	Collaborative	High
Teacher 8	Personal=62	Highly Involved	Fragmented Individualism	High
Teacher 9	Personal=62	Involved	Collaborative	Minimal
Teacher 16	Personal=60	Highly Involved	Collaborative/ Balkanization	Minimal
Teacher 5	Personal=55	Highly Involved	Collaborative	High
Teacher 13	Personal=40	Highly Involved	Collaborative	Minimal
Teacher 7	Personal=20	Highly Involved	Partial Team Fragmented/Grade Level Collaboration	High

After presenting evidence in the area of school leadership, the focus will shift from the overall school to smaller units of leadership found in Team/Grade Level Subculture followed by examples illustrating the influence of these unofficial leaders. The discussion concludes presenting evidence supporting the remaining information presented in Table 14 related to the Form of the Team/Grade Level Subculture.

Examples of initiative related school leadership

The median Personal Stage score was 70. Of those teachers scoring at or below this median score, four teachers worked in the schools with a more cohesive instructional leadership profile. Fullan's (2001a) Leadership Model was used as a framework for data collection in the areas of school leadership (See Figure 13; p. 69) then expanded to include other characteristics such as (1) distribution of leadership, (2) focused planning, and (3) activities and information seeking related to the Mathematics Curriculum Initiatives under investigation in this study. The resulting profiles are not a reflection on a single individual but instead the sum total of the leadership elements in a particular school including principals, department chairpersons, team leaders, and unofficial leaders within that school who chose to participate in the study.

Analysis of leadership data found little, if any, leadership in instructional areas related to the Mathematics Curriculum Initiatives in three of the four schools participating in the study. The fourth (School B) school exhibited a more cohesive Leadership Profile related to the Mathematics Curriculum Initiatives. Interactions between the researcher and leaders in School B far outnumbered those of the other schools. Moreover, the substance of these interactions differed in content. Analysis of the leadership characteristics found at School B specifically related to the Mathematics Curriculum Initiative determined the following frequency of Codes aligned with Fullan's Leadership Framework (2001): Understanding Change – 12; Coherence Making – 7; Moral Purpose – 5; Relationship Building – 10; and Knowledge Creation and Sharing – 19. Further analysis of the leadership profile in School B indicated a more distributed leadership team in the school who participated in the focused planning in relation to the Mathematic Curriculum Initiatives. Unfortunately, Side-by-Side tabular comparisons of Coding frequencies of each school's leadership characteristics is not appropriate due to the differing number of leaders from each school participating in the study.

The following observations and interview data from the researcher's field notes illustrates what the information in Table 14 describes as *High* initiative related school leadership.

Select Researcher Field Notes of Leadership Characteristics found in School B:

XX-XX-05 Discussion with Leader about meeting [he/she] had with [other Leaders]. Meeting involved PSSA report from PDE and individual student reports. Leaders within school are communicating.

XX-XX-05 Reflection discussion with Teacher about how Teachers 5/6/7 met periodically to strategize on topic and strategies to present to students during IOP. These discussions helped design the MCI of this year.

XX-XX-05 Planned Meeting with [Leader]. [His/Her] idea. Goal moving MCI/RCI expansion forward. Discussion was not specifically math; included Reading; including district level; including discussion of problems at HS. Asking for my perspective. Wanted a report on each team’s progress. "What can I do better" Suggestion to reduce the conversation down to individual team level; instead of building/grade level. Review individual team/teacher strength/weakness. [He/She] knows [his/her] people/ what they can/ what they will do/what they won't do. Strangely, willing to accept that some will not implement the initiative. Not willing to mandate the MCI. Review the success of last year; analyzed how the success happened. Idea is to use that as the standard. Back to HS problems; “we have to solve that problem.”

XX-XX-05 Brief Discussion with Leader; alluded to the meeting [he/she] had with [another Leader] about moving the MCI/RCI Expansion forward: "[He/She] is going to meet with every team"

Researcher’s Reflections on the Leadership Profile of School B on XX-XX-05:

Principals' Leadership presents a common theme in support of MCI - focus of Moral Purpose. High Energy, Enthusiasm, and Hope; Practice Distributed Leadership within School; Seeking Specific Info; Understands Change; Many Relationships; Lacks some depth of understanding of MCI for Coherence Making.

One unofficial Teacher Leader added to the School Leadership team; and at times took the lead in influencing Change; without this leader, Teacher’s ABC and Implementation may have been very different.

Examples of less initiative related school leadership

School A, School C, and School D exhibited a less cohesive instructional leadership approach to the Mathematical Curriculum Initiatives. The following field notes are presented in support of the findings in this area and are representative examples of characteristics found in all three schools illustrating *Minimal* initiative related leadership in the school.

Select Researcher Field Notes of Leadership Characteristics found in School A:

> XX-XX-05 Impromptu discussion with leader walking up hallway. I asked the Question: "How's [academic area] going?" as a conversation starter. Leader brought up the new positions at the HS and how that will affect the HS. How tutoring will be implemented and why it will not work. Then discussion moved to Literacy Day on Inservice Day and how leader didn't think it would be useful. How district leadership is pulling [teachers] out of building to prepare for this day. "Waste of Time." Focus is outside the building; not within the building; sees the bigger picture as being flawed. Not focused on building issues within [his/her] realm of responsibility.
>
> XX-XX-05 Meeting with [Leader] about MCI ideas for IOP and their affect on [other] Initiatives during IOP. Shared plan. Leader displayed great concern in how [he/she] would support these type of initiatives in the area of [academic subject]. Conversation moved to how [he/she] does like the PSSA; Does not like the PSSA "Multiple Choice" questions cannot test [academic area] ability" "[Academic area] is Development" "PSSA

does not test [this academic area]" "Multiple Choice questions do not cover spectrum of what [teachers] need to do to improve student reading." Facial Expression was blank and body language led me to believe [he/she] has great concerns at multiple level with High Stakes Testing in general and how the MCI will impact [his/her] roll in the school. Sense of anger with the ideas. Not sure if this reaction was about student needs or [his/her] needs.

XX-XX-05 Discussion with Leader: Talked about PSSA MCI plan for the year. Looking forward for Math Coach to begin pushing the ideas. Seemed to not want to be involved in the initial push. "Thinks it is a good idea" Wants to know about progress so [he/she] can deal with issues that may arise as a result of my discussions with people. Clear concern regarding implementing change and confronting common barriers/excuses impeding change.

Researcher's Reflections on the Leadership Profile of School A on XX-XX-05:

No Involvement/Support/Leadership from Principals in initial year.

Teacher Leaders present a mixed message to teachers. One Teacher Leader in Disagreement with the MCI/RCI; Knowledge Building is evident from this Leader; Relationship built over time; Moral Purpose in conflict with MCI/RCI; Disagreements with NCLB/PSSA/MCI philosophy/District Leadership. Another Teacher Leader in Support and Pressuring others to implement; High Energy; Seek and Distribute Knowledge; Relationship - Both Old and New; Moral Purpose centered around Higher Scores; Change in Leadership Focus once results available.

The preceded evidence contrasted the difference between school leadership with *High* initiative related support and those with *Minimal* initiative related support. In the following section, evidence is presented identifying one component of Fullan's Leadership Framework (2001a) that seemed to differentiate the profiles of schools with *High* initiative related leadership from those with *Minimal* initiative related leadership.

Leadership's depth of knowledge creation and sharing

In the Category of Knowledge Creation and Sharing (Fullan, 2001), sub-codes were used to distinguish between different types of the information and knowledge gathering or shared. The Leadership Profile of School B indicated a more detailed and in-depth development and sharing of knowledge related to the initiatives. Other School Leadership Profiles pointed toward a more general, status report type of knowledge gathering and sharing.

The following Field Note entries illustrate the difference in the depth of knowledge creation and sharing noted in School B as compared to the other three schools:

Select Researcher Field Note of Discussion with a Leader in School B:

> XX-XX-05 Meeting/Discussion with Leader reflecting on last year's MCI and their success. "We did everything we could have" Standards based curriculum; test prep on the day. Review the exact sequence of what we did. "We couldn't have done more" "This 8th grade group of

teachers did it all.” Discussed the expansion of MCI to lower grades. Talked about the new teams involved; issues/personalities/etc. Wanted to know what [he/she] could do to help facilitate the expansion in the lower grade. Discuss "the plan" to begin spinning the ideas with staff. The HS's low scores were discussed again.

XX-XX-05   Continuations of meeting with Leader. Discussed expansion model in detail; line by line. Asked clarifying question to help understand the model. Actually wanted to understand it. Discussed what it meant to each different individual team/teacher. Began identifying potential obstacles like the music pull out. Issue with other department not being on board of the improvement plan. Wants to know "what will make it work."

In contrast to the depth exhibited in School B, the following example illustrates a less specific type of knowledge creation and sharing.

Select Researcher Field Note of Discussion with other leaders in different schools:

XX-XX-05   Discussion with Principal while [he/she] worked on [another initiative]. [He/She] asked the question: "Are we ready for the PSSA" Hoping our efforts would pay off this year. I express concern with the size of the testing window on the school, "See what happens" seemed not to be concerned about the topic; or would rather not involve me in that decision.

> XX-XX-05 Leader continues to ask for updates on progress on expansion of MCI. "How is it going" Still no indication on [his/her] involvement; hasn't talk to anybody on the topic.
>
> XX-XX-05 Leader pays [his/her] routine AM visit to [my location in the school]. Talks about the expansion of MCI during IOP. What we need to do to improve scores. More or less informational; Not so much about what [he/she] is going to do but more about what I am going to do; what the district is going to do.

With evidence contrasting overall school leadership in place, the focus shifts to Team/Grade Level Subculture found in the schools participating in the study. In the following sections, discussion and evidence will be presented in support of the information in Table 14 illustrating *High* initiative related leadership found at the team/grade level in particular schools along with examples of *Collaborative* Form of the team/grade level subcultures.

Examples of initiative related team/grade level leadership

The second common theme among those teachers with lower Personal Stage Scores is the existence of an additional leader who was a member of the immediate Team/Grade Level subculture. All seven of the teachers with Personal Stage scores at or below the median scores belonged to a subculture within their school that had a leader who was highly involved in the improvement of state assessment results. In the case of Teacher 5, Teacher 6, Teacher 7 and Teacher 8, these unofficial leaders are in addition to the more coherent leadership profile that exists at the larger school level. However, in the case of Teacher 9, Teacher 13, and Teacher 16, the unofficial, local subculture leadership existed without a significant school-wide initiative leadership. Below are researcher Field Notes illustrating the existence of the unofficial initiative leadership belonging to the team subculture.

Select Researcher Field Note on Unofficial Leadership at the Team Level:

> XX-XX-05 Observation: Given lack of leadership from official leaders, seems a small group of people from within the school can push change within their realm of influence and be able to influence change and PSSA Scores. Can that be accomplished in a broader sense? Realm of influence might be the key.
>
> XX-XX-05 Discussion with Leader about two Math Teachers (Teacher 13 and Teacher 15) who are deeply involved in using MCI in IOP and regular class. Frustrated that another teacher (Teacher 14) is not doing anything with MCI. Speculates that the lack of implementation may be from the influence of another teacher with whom the Teacher is working closely with.
>
> XX-XX-05 Discussion with Leader about School Culture and implementing MCI/RCI during IOP. Will be difficult because it requires a lot more work from some people. "Principal will be key" that [he/she] not be overzealous and just put pressure but lets people make their own decision on implementation. A process requiring time. Curious to see if teachers follow their words about improving with action in the classroom.

Discussion moved to how this is the first time many teachers will be accountable to a HST; there is some anxiety.   Interesting many teachers in lower grades are elementary certified; not Mathematics certified; some may feel inadequate/confidence issues. Leader was a bit surprised about some of the resistance given by people about MCI/RCI initiatives; thought they would be more receptive.

Examples of collaborative team/grade level subcultures

The seven teachers with low Personal Stage Concern scores also are members of Team/Grade Level Instructional Subculture that displays more collaborative characteristics than those teachers with a higher Personal Stage Score. The following are excerpts from researcher field notes on depicting a collaborative form of team subculture.

Select Researcher Field Note on Form of Team Culture:

XX-XX-05   Observation: Teams of teachers at each grade gather periodically to discuss grade level issues - instructional/organizational/procedural. Schools have an entire area with large number of square footage for meeting. Each grade actually has its own IPC planning areas. These meeting times are assigned by the administration as a duty period one out of six days per rotation.

XX-XX-05   Observation on Team: Teachers do a spaghetti dinner for kids based on their academic performance. They cook the food and serve it wearing black pants and white shirts.

XX-XX-05 Observation: Team [X] does a huge Veteran's Day Ceremony for local area veterans. Speakers from WWII. Taps. Decorations. TV News. Huge Flag painted on Hillside in front of the school. Led by Subculture Leader.

XX-XX-05 Observation/Reflection on Inservice Days in Spring 2005. Scheduled a double session involving improving PSSA. Also, catered staff lunch in the building bringing everyone together.

The influence of the areas of: (1) a cohesive school leadership team; (2) a local sphere leadership; and (3) a collaborative form of Team/Grade Level subculture on teacher's Personal Stage of Concern are not clear. However, a clear pattern exists in the data if all three components are absent as illustrated by Table 14. All teachers with above median Personal Stage Scores are in schools with (1) less coordinated school level leadership related to the Mathematics Curriculum Initiatives; (2) minimal team/grade level leader in support of the initiative; and (3) a more fragmented, partial team/grade level subculture. Four of the six teachers with high Personal Stage Concerns are either not members of middle school teams or belong to partial teams that do not have uniform schedule, common planning time, or common students. These conditions exist not by teacher choice but by scheduling and financial constraints.

The Team/Grade Level subcultures discussed in these findings may exhibit key facets of what Dufour and Eaker (1998) describe as *Professional Learning Communities* within schools. Further discussion and implications of this connection will be presented in the following chapter.

Table 15

Comparison of Teacher's Impact Concerns with Leadership and Team Culture

Teacher	Teacher's SOC "Impact" Stage Score	Initiative related Team/Grade Leadership	Form of Team Subculture	Initiative related School Leadership
Teacher 3	Impact = 187	Minimal	Partial Team/Fragmented Minimal Interaction	Minimal
Teacher 1	Impact = 175	Minimal	Fragmented Individualism	Minimal
Teacher 2	Impact = 162	Minimal	Fragmented Individualism	Minimal
Teacher 6	Impact = 154	Highly Involved	Collaborative	High
Teacher 9	Impact = 151	Involved	Collaborative	Minimal
Teacher 12	Impact = 147	Non Member	Fragmented Individualism	Minimal
Teacher 5	Impact = 147	Highly Involved	Collaborative	High
Teacher 7	Impact = 117	Highly Involved	Partial Team/Fragmented but Grade Level Collaboration	High
Teacher 13	Impact = 115	Highly Involved	Collaborative	Minimal
Teacher 10	Impact = 114	Minimal	Partial Team/Fragmented Minimal Interaction	Minimal
Teacher 16	Impact = 113	Highly Involved	Collaborative/Balkanization	Minimal
Teacher 8	Impact = 88	Highly Involved	Fragmented Individualism	High
Teacher 14	Impact = 15 Refocusing = 55	None	Partial Team/Fragmented Minimal Interaction	Minimal

Impact Concerns related to school culture and leadership

After identifying apparent patterns in teacher's Personal Stage Concern Scores and school culture and leadership characteristic, the question remains about the potential relationship between other Stages of Concern and school culture and leadership. Table 15 compares teacher's Impact Scores from the Consequence and Collaboration Stages of their Concern profile with characteristics of leadership and team culture. No pattern is apparent in the data, though two teachers indicate high levels in the area of Impact Concerns regardless of elements of culture and leadership. The two teachers with lowest Impact Concern Scores had Stages of Concern profiles characterized by an elevated Refocusing Stage. According to Hall and Hord (2001), this may indicate potential resistance to the Mathematics Curriculum Initiatives under investigation in the study.

Additional Finding Related to Teacher's Attitudes, Beliefs, and Concerns

The final finding related to the research questions examining leadership and school cultural influences on teacher's attitudes, beliefs, and concerns was unanticipated. In discussing their Stages of Concerns Model, Hall and Hord (2001) describe a progression of concerns through the seven stages based on time, leadership, and support of the initiative. While the Stages of Concern profile developed from the question provides a snapshot of teacher's status at the time of the questionnaire completion, the ethnographic design of the study was able to monitor individual teacher's Stages of Concerns over a period of months. Interview and observation data provide evidence that teachers may not progress through Hall and Hord's stages in a linear fashion as suggested. Specifically, teachers who have advanced to the Impact Stages of

Consequence and Collaboration periodically regress back to the focus of Management Stage issues as they struggle to implement the Mathematics Curriculum Initiatives. Analysis of the data in this area did not identify a change in commitment to the initiatives under investigation as a cause of the regression but instead, shifts in the availability of time to manage the initiatives. The impact of new initiatives on a teacher's normal working day is the subject of many empirical studies citing the lack of time to plan, collaborate, and implement new practices practices (e.g., Leggett & Persichitte, 1998; Reeves, 2002). Findings in this study point to a regression in a teacher's Concerns Profile based on changes in individual teacher's priorities both in their professional and personal lives. Teachers allot their available time during any given period of time to the most immediate of these priorities. A shift in priorities can result in a change in a teacher's Concern Profile as the availability of time to manage the Mathematics Curriculum Initiatives is devoted to new priorities. These changes in a teacher's Concern Profile occur on a daily basis and last for various durations depending on individual teacher priorities. The following are select entries in the researcher's field notes illustrating how other professional issues are given priority to the available time.

Select Researcher Field Note Entries from Various Schools:

> XX-XX-05 Observation: Teacher is a new member of the [another school initiative]. Much of [his/her] working time and energy goes toward developing and supporting that program.
>
> XX-XX-05 Observation: At 7:15 am, Teacher is preparing for a morning announcement video recording. Apparently, members of staff are dressing

up as the "Fruit of the Loom" characters in support of a nutritious eating campaign. Part of some grant involving "Healthy Eating."

XX-XX-05 Discussion with Teacher about meeting to discuss the expansion of MCI during IOP. [He/She] is very busy; continued to [another project] as we talked. Option to meet in a week or so; Said Yes, as the [other school activity] stuff would be mailed by then and [he/she] could refocus on things.

Other professional responsibilities were not the only demand on the use of available time to teachers. Below are select Field notes alluding to other personal priorities that impact the prioritizing of available time.

Select Researcher Field Note Entries from Various Schools:

XX-XX-05 Observation: Teacher was absent: child issue at home. During Absence IOP class was reduced to a silent reading period/study Hall

XX-XX-05 Observation: Teacher seems preoccupied. Apparently, terminally ill pet at home. Did not talk about MCI. Seems preoccupied during IOP lesson. Working on planning for the next class; in and out of the room.

XX-XX-05 Observation: Teacher absent on Halloween to attend own kids Halloween Parade.

In summary of the influences on teacher's attitudes, beliefs, and concerns, the findings of this study indicate patterns in individual teacher's Stages of Concern profiles – specifically Personal Stage Concerns – and the existence of both school level and team/grade level leadership in support of the Mathematics Curriculum Initiatives. While examining this relationship, the data unexpectedly provided evidence that the forms of school culture may be different for instructional and non-instructional activities in a school. In addition, data indicates the existence of Team/Grade Level subculture that also can be described using the *Forms of School Culture* (Hargreaves, 1994).

The form of the Team/Grade Level subcultures may have a larger influence on teacher's attitudes, beliefs, and concerns than the overall school culture. Specifically, those teachers who did not experience overall school leadership along with the absence of a collaborative team/grade level subculture and leadership within that subculture exhibited higher Personal Stage scores on the Stages of Concern Questionnaire. The final finding in this area indicates that the progression of the Stages of Concern may not be linear but instead may periodically regress based on the teacher's priorities and the availability of time to address these priorities.

Summary of Findings

The findings presented in this chapter indicate both the interrelatedness and complexity of the factors influencing student achievement, implementation of Mathematics Curriculum Initiatives, and teacher's attitudes, beliefs and concerns. Findings can be summarized as follows:

(1) Patterns of a teacher's attitudes, beliefs, and concerns matched patterns in their implementation of the Mathematics Curriculum Initiatives under investigation in this study;

(2) the degree to which teachers implemented the Mathematics Curriculum Initiatives reflects patterns in student achievement on the state assessment;

(3) a school may exhibit different *Forms of School Culture* when instructional and non-instructional activities are examined separately;

(4) a teacher's attitudes, beliefs, and concerns about the Mathematics Curriculum Initiatives were influenced by the immediate Team/Grade level culture and leadership within that culture more so than overall school culture and leadership;

(5) a key component in the relationship between leadership and teacher's attitudes, beliefs, and concerns involved the depth of *Knowledge Creation and Sharing* (Fullan, 2001a) exhibited by school and team leaders; and

(6) the availability of time to plan, manage, and incorporate the curriculum initiatives played a significant role in determining teacher's attitudes, beliefs, and concerns about the initiatives.

These findings have a number of implications in the individual areas of leadership and school culture related to Fullan's Leadership Framework (2001), Distributed Leadership (Elmore, 2000), and Professional Learning Communities (Dufour & Eaker, 1998). Additionally, the findings provide evidence that teachers may not progress through the Stages of Concerns in a linear manner as suggested in Hall and Hord's

Concerns Based Adoption Model (2001). Instead, teacher's concerns may, at times, regress based on the availability of additional time to implement the initiative in question.

While each sub-research question has specific implications, the findings also have implications for the study's broader research question: What are the relationships between the implementation of mathematics curriculum initiatives; student achievement on state assessments; school culture; school leadership; and teacher's attitudes, beliefs, and concerns about test-driven accountability? When examined as a whole, the individual findings may provide a better understanding of the very complex set of interrelated factors in the school environment influencing changes in classroom instructional practices in order to improve the achievement of all students. At the center of that mix are individual teachers and their attitudes, beliefs, and concerns. A more detailed discussion of the findings will be presented in the following chapter as both individual and broader implications of the research questions are examined.

CHAPTER FIVE: SUMMARY AND DISCUSSION

The final chapter of this dissertation will briefly reframe the research problem under investigation in this study followed by a review of the major facets of the methodology employed in the design. After summarizing the findings presented in Chapter 4, conclusions and educational implications of the research findings will be addressed in the context of the broader significance of this research.

Background on the Problem

As presented in Chapter 1, this study investigated factors that influence a teacher's implementation of mathematics curriculum initiatives. These initiatives were designed to improve student achievement on mandated state assessments. The societal context surrounding this investigation is one where public opinion continues to view the nation's public educational system as needing improvement (Rose & Gallup, 2003) while national and international assessments identify significant achievement gaps both within the national school age populations (Braswell et al., 2001) and in comparison with children in other countries (Mullis et al.,1998). The educational reform movement, particularly in the area of teacher and school accountability, continues to be a critical issue in the face of the No Child Left Behind (NCLB) legislation passed in January 2002. NCLB is the federal government's latest attempt to improve the nation's public school system by requiring the testing of students in reading and mathematics in grade 3 through grade 8 and holding schools accountable for the results.

As a result, school districts across the nation rush to realign curriculum and to adopt new initiatives to address the test-driven mandates of the federal legislation. Unfortunately, district level curriculum initiatives frequently fail during their implementation due to interrelated factors within the organizational context of the school (Sarason, 1990). The lack of understanding of how these contextual factors are related to the implementation of curriculum initiatives presents a significant barrier to changing instructional practice in the classroom. Until there is a better understanding of how individual teachers and school contextual factors affect the implementation process, curriculum reform initiatives will continue to be largely ineffective in improving student achievement (Sarason, 1990).

The primary responsibility of implementing such improvement initiatives falls on each school and the individual teachers in those schools. This study investigated the implementation of such curriculum initiatives while focusing on school contextual factors and the individual teacher.

This study examined the influence of specific elements of school context on the implementation process of mathematics initiatives designed to improve student achievement on state-mandated assessments. Specifically, this ethnographic investigation studied the relationship between (1) teachers' attitudes, beliefs, and concerns about the new mathematics initiatives; (2) their implementation of these initiatives; (3) and the resulting impact on student achievement on state standardized assessments. Additionally, this study examined how school contextual factors such as school culture and leadership influenced teachers' attitudes, beliefs, and concerns about mathematics curriculum initiatives and test-driven accountability.

Research Question

The lack of understanding of the curriculum implementation process in the new test-driven accountability environment resulting from the NCLB legislation led to this study's broad research question concerning the relationships between (1) the implementation of mathematics curriculum initiatives; (2) student achievement on state assessments; (3) school culture; (4) school leadership; and (5) teacher's attitudes, beliefs, and concerns about test-driven accountability.

The review of the literature in Chapter 2 presented support for the research question and synthesized the existing conceptual and empirical literature associated with school contextual factors and their influence on implementation and student achievement. The review identified causes of implementation failure resulting from contextual factors within the school environment. The focus then shifted to the identification of four critical elements within the larger school context and their individual influence on the implementation. These elements are (1) school culture; (2) teacher's values and beliefs; (3) the perceived merits of the initiative; and (4) leadership.

The first of these elements is school culture. The literature defines school culture as a combination of (1) a shared set of values and norms; (2) individual values and norms; and (3) standards for interaction and relationships within a school (Boyd, 1992; Deal & Peterson, 1999). Particular types and characteristics of school culture facilitate the implementation of educational initiatives (e.g., Hargreaves, 1994; Little, 1982; Louis & Miles, 1990).

School culture both influences and is influenced by the second element; the individual teacher's attitudes, beliefs, and concerns. The literature clearly illustrates the significance of teacher’s attitudes, beliefs, and concerns in determining their classroom practices. Moreover, individual teacher attitudes and concerns associated with the initiative itself also influences their classroom practices (e.g., Hall & Hord, 2001).

The third element involved teachers’ perceptions of the merits of the initiatives. As a result, both unanticipated outcomes of test-driven accountability systems and teachers’ perceptions of those systems were discussed in the review.

The final element focused on initiative related leadership. The review identified school leadership qualities and support elements that have a significant influence on both school culture and teacher’s attitudes, beliefs, and concerns about an educational initiative.

Recent empirical work has begun to identify school contextual factors that may be able to overcome other predetermined contributing factors of student achievement such as socioeconomic status and family background (e.g., Chubb & Moe, 1990; Marzano, 2003). These findings point to the significance of this dissertation research in studying the school contextual environment in order to better understand those factors that may improve the achievement of all students regardless of their background.

The review provided support for the conceptual framework of this study, along with the expansion of the broad research question to include the following sub-questions:

1. How did teacher’s attitudes, beliefs, and concerns about test-driven accountability relate to the implementation of mathematics curriculum initiatives?
2. How did a teacher’s implementation of mathematics curriculum initiatives relate to student achievement on state assessments?

3. How did teacher’s attitudes, beliefs, and concerns about test-driven accountability relate to student achievement on state assessments?
4. What was the influence of principal and curriculum leadership on teacher’s attitudes, beliefs, and concerns?
5. What was the influence of school culture on teacher’s attitudes, beliefs, and concerns?

Review of the Methodology

Based on the conceptual framework established from the existing literature, a preliminary mixed methods research design was developed to facilitate the exploration of school contextual factors of school culture; teacher’s attitudes, beliefs, and concerns; and leadership as they are related to the implementation of mathematics curriculum initiatives and student achievement in a test-driven accountability environment. The mathematics curriculum initiatives under investigation include: (1) providing additional instruction to academically at-risk students; (2) providing in-classroom instructional support to teachers of mathematics; and (3) providing additional resource materials specifically designed to focus teachers’ instructional practices.

The data collection period ran parallel to data analysis as an integral part of the ethnographic methodology (Fetterman, 1989; Miles & Huberman, 1994) described in Chapter 3. This concurrent process allowed the researcher to adjust the focus of the data collection as new patterns and themes emerged in the data (Fetterman, 1989; Freebody, 2003; Jorgensen, 1989; Miles & Huberman, 1994; Patten, 2002). Data collection progressed through a number of phases. The first 10 weeks of data collection was spent exclusively gathering, identifying, categorizing, and analyzing quantitative data in the form of state assessment scores from 2004 and 2005. The next 12 weeks were used to gather and analyze teacher questionnaire responses and the qualitative interview and observation data as described in the research design of this study. Additional data reduction and analysis continued for four weeks beyond the 22-week data collection period as recommended by Miles and Huberman (1994) in order to further reduce and synthesize the data resulting in the various tables throughout Chapter 4.

The concurrent nested mixed method design (Creswell, 2003) of the study using quantitative analysis embedded in a larger qualitative exploration facilitated the explanation of the influences of teacher’s attitudes, beliefs, and concerns; school culture; and school leadership on the implementation of initiatives aimed at improving students’ state assessment scores. The quantitative elements centered on the norm-referenced Pennsylvania System of School Assessment (PSSA) in Mathematics and the independently validated Stages of Concern Questionnaire (Hall & Hord, 2001). At the same time, an ethnographic design was used to study the complexity of the implementation process within the school culture. Moreover, the flexibility of the concurrent nested design provided the opportunity to study unanticipated questions that emerged during this investigation. The ethnographic design helped identify unforeseen factors influencing the implementation of the curriculum initiatives that are only apparent to the classroom teacher within the context of the individual school culture.

Prior to investigating any patterns of influence on assessment scores, assessment score data was analyzed to identify any significant changes from 2004 to 2005 in similar groupings of students. The analysis process began by attributing each student score to the teacher responsible for the mathematics instruction of that student. Additionally, student assessment scores were classified in one of three categories based on the type of math class they took during their eighth grade year. The process of attributing the individual student scores to teachers and classifying them by category of the math instruction was determined by examining individual student schedules and report cards for 807 eighth-grade students from 2004 and 852 students in 2005. Each student score was assigned to a math teacher and a category of math class that they were enrolled in during that year. Once the attribution and classification process according to teachers and categories of math class was complete, student names and other demographic information was deleted to maintain anonymity of individual students. The process of attributing the individual student scores to teachers and classifying them by category of math course resulted in 13 groups of student assessment scores that were the direct focus of the implementation of the Mathematics Curriculum Initiatives in 2005. These 13 groups were compared to similar student groupings from the previous year's state assessment.

Descriptive analysis of the data sets was done by using a Box and Whisker Plot producing mean, median, ranges, and other general data distribution information. Since the assessment scores in 2004 and 2005 are from different cohorts of students, a second descriptive analysis was used to examine significant changes in the distribution of the data sets. A Kolmogorov-Smirnov (KS) Distribution Test was used to determine if the 2004 and 2005 data sets differ significantly. The analysis produced a graphic distribution function displaying changes in the distribution of scores and identified a point of maximum distribution change from one year to the next along with providing a P value identifying the confidence level to which any changes in the distribution may be caused by normal fluctuations in the data sets instead of the Mathematic Curriculum Initiatives. The level of significance was set at 0.05.

In the broad qualitative design, an ethnographic exploration by a participant observer was used to investigate the implementation of math curriculum initiatives recording the complex interaction of (1) school culture; (2) teacher's attitudes, beliefs, and concerns; (3) and leadership factors. Eighth grade mathematics teachers, learning support teachers, and school leaders in four middle schools in a suburban Philadelphia school district were asked to participate in the study. A Letter of Invitation to participate in the research study resulted in the inclusion of 13 teachers and 13 school leaders. The school district and schools were selected based on a number of factors: (1) the district had recently adopted new Mathematics Curriculum Initiatives designed to improve student achievement on the state assessments; (2) the district's willingness to participant in the research study; and (3) the district's accessibility to the researcher/participant observer for the duration required for the ethnographic investigation.

The researcher, as participant observer, served in the role of Middle School Mathematics Coach designed to provide curriculum support on the implementation of initiatives intended to improve student achievement on state assessments. The researcher, in the capacity of Mathematics Coach, began the immersion in each school setting by working with the teachers and school leaders on the implementation of the Mathematics Curriculum Initiatives on a weekly basis during the prior academic school year. During the fall of the following school year, informal interviews and observations of teachers and school leaders were conducted over a three-month period of time. As per the ethnographic research design, qualitative data was gathered in a non-obtrusive, naturalistic manner as the researcher interacted with participants during the course of the normal job function. Over the course of this 12-week phase of the data collection period, the researcher made 108 visits to the four participating schools ranging in duration from one hour to 8 hours in length. During these visits, nearly 500 field notes were recorded ranging in duration from 10 seconds to one minute in length.

The analysis of the data was examined for patterns and themes within the ethnographic findings in each contextual area in relation to implementation levels and student achievement scores on state mathematics assessments. Data coding and reduction of the large quantity of qualitative data was facilitated by the ATLAS.ti visual data analysis software.

Concurrent to the qualitative exploration, a cross-sectional survey (Wiersma, 2000) was employed to further explain relationships between teacher's attitudes, beliefs, and concerns about the test-driven accountability; their implementation of the curriculum initiatives and students' achievement results on standardized assessments. Eighth grade mathematics teachers and learning support teachers in the four middle schools were asked to participate in the Stages of Concern Questionnaire (SoCQ) (Hall & Hord, 2001) to determine their individual concerns regarding the curriculum initiatives and the test-driven accountability system. Results of the SoCQ were compared to each teacher's level of implementation and changes in student PSSA scores as described previously in this section. A comparison analysis of the teacher's Stages of Concern; their level of implementation; and students' assessment scores was used to determine relationships between the sets of data articulated in this study's findings.

Summary of the Findings

The findings presented in Chapter 4 indicated both the interrelatedness and complexity of the factors influencing (1) teacher's attitudes, beliefs, and concerns; (2) the implementation of the Mathematics Curriculum Initiatives; and (3) student achievement on state assessments. In the following section, a summary of the findings is presented for each of the five research sub-questions. Specific details and supporting evidence of this summary are found in Chapter 4. After summarizing the findings, a discussion involving conclusions and the implications of the research findings will be presented in a separate section.

Research Question: How did teacher's attitudes, beliefs, and concerns about test-driven accountability relate to the implementation of mathematics curriculum initiatives?

Patterns of a teacher's attitudes, beliefs, and concerns matched patterns in their implementation of the Mathematics Curriculum Initiatives under investigation in this study. Specifically, teachers with higher levels of *Impact* Concerns of their Stages of Concern Profile exhibited higher Implementation Levels of the Mathematics Curriculum Initiatives. Whereas, teachers with higher Self Concerns of their Stages of Concern Profile exhibited lower Implementation Levels. Teachers with higher *Impact* Concern scores tended to (1) interact with the researcher more frequently; (2) seek detailed information about the curriculum initiatives; and (3) engage in more collaborative discussions with others about the implementation of the curriculum initiatives. These same teachers demonstrated more *Routine* and *Integrated* Implementation Levels than those teachers with higher Self Concern scores. Teachers with higher *Impact* Concern scores had (1) a more structured Instructional Opportunity Period (IOP) involving additional math instruction; (2) more involvement in the presentation of the Mathematics Curriculum Initiatives during IOP; and (3) transferred the initiatives to their math classes on a regular basis.

Research Question: How did a teacher's implementation of mathematics curriculum initiatives relate to student achievement on state assessments?

The degree to which teachers implemented the Mathematics Curriculum Initiatives reflected patterns in student achievement on the state assessment in two areas. Groups of students that received additional math instruction exhibited increases in state assessment scores when compared to similar student groups from the previous year. Groups of students that received at least one additional period of math instruction per cycle during their IOP class showed a range of improvement in state assessment scores between 30 and 100 scaled score points when compared to similar student groupings from the previous year. These same groups demonstrated overall increases in the percentage of students scoring Proficient or Advanced on the state assessment ranging from 6 percent to 24 percent.

The second pattern involved groups of students that had a teacher who was more involved in the additional Math Instruction and used the curriculum initiative more regularly in their math classes. These groups exhibited even greater increases in state assessment scores ranging from 70 to 110 scaled score points when compared to similar student groupings from the previous year. These groups of students also showed significant increase in the percentage of students scoring Proficient or Advanced; increases ranged from 14 percent to 35 percent.

Research Question: How did teacher's attitudes, beliefs, and concerns about test-driven accountability relate to student achievement on state assessments?

As designed, this research question sought to identify patterns and themes in the Composite School-Level Concerns Profile and the overall changes in school state assessment results. Each participating school exhibited increases in state assessment results from 2004 to 2005. Unfortunately, composite school-level teacher concerns profiles were comprised of too few teachers - each with very diverse Concerns Profiles - to determine any relationship with assessment scores changes. Overall, school improvements included increases in the mean scaled-scores ranging from 22 points to 90 points and increased in the overall percentage of students scoring Proficient or Advanced ranging from 5 percent to 20 percent. While no patterns could be determined at the overall school level, patterns based on individual teacher's Stages of Concern Profiles and student assessment results may exist. This topic will be discussed further in the following section of this chapter.

Research Question: What was the influence of school culture on teachers' attitudes, beliefs, and concerns?

Somewhat unexpectedly, the findings indicated that a School Culture may take on different *Forms* when instructional and non-instructional activities are examined separately. Two of the four schools in the study exhibited very responsive, collaborative cultures when involved in the non-instructional activities such as (1) student social activities; (2) charity fundraising activities; and (3) student awareness initiatives. When it came to instructional activities, these same schools demonstrated a *Balkanized Form* of School Culture (Hargreaves, 1994) where individual Team/Grade Level subcultures were the dominant force in the decision-making process. The Form of each individual team/grade level subcultures varied from *Collaborative* to *Fragmented Individualism* (Hargreaves, 1994). These Team/Grade Level subcultures seemed to have the greatest influence on teacher's attitudes, beliefs, and concerns about the Mathematics Curriculum Initiatives. The lack of a *Collaborative* Team/Grade Level subculture was related to higher levels of *Personal Concerns* in a teacher's Stages of Concern Profile. *Collaborative* Team/Grade Level Subcultures and lower *Personal Concern* Levels were marked by the existence of a leader within the subculture who exhibited strong support for the Mathematics Curriculum Initiatives under investigation in this study.

Research Question: What was the influence of principal and curriculum leadership on teachers' attitudes, beliefs, and concerns?

In addition to the influence of School and Team/Grade Level Cultures, are the findings related to elements of School Leadership. School Leaders were not limited to Principals or other official school leaders but also included persons who exhibited leadership related to the initiatives investigated in this study such as (1) team leaders; (2) reading specialists; and (3) unofficial opinion leaders in each school. The findings in the areas of leadership indicated that initiative related leadership, both at the school level and the team/grade level, influenced teacher's attitudes, beliefs, and concerns about the Mathematics Curriculum Initiatives. More precisely, the findings identified the depth of what Fullan (2001a) describes as *Knowledge Creation and Sharing* as being a distinguishing factor between highly supportive initiative related leadership and more moderate levels of support directed toward the initiatives.

While the influences of (1) school culture, (2) team/grade level culture, (3) overall school leadership, and (4) team/grade level leadership are indistinguishable, a clear pattern exists when these components are not present. The lack of leadership related to the initiatives in concert with the lack of a collaborative team/grade level subculture was associated with a higher level of the Personal Concerns in teacher's Stages of Concern Profiles that in turn was associated with lower levels of implementation.

An Additional Finding Related to Teacher's Attitudes, Beliefs, and Concerns and Implementation of the Mathematics Curriculum Initiatives

An additional unanticipated finding related to influences on teacher's attitudes, beliefs, and concerns was the availability of time needed to manage the implementation of the Mathematics Curriculum Initiatives. The findings suggest that while teachers progress through the Stages of Concern in a linear fashion, from *Self Concerns* to *Management Concerns* to *Impact Concerns*, there may also be periods of regression back to a previous Stage. This regression was associated with shifts in availability of time as teachers juggled other professional and personal priorities. The findings suggest that the availability of time may have a greater influence on teacher's attitudes, beliefs, and concerns and the Implementation of a new initiative than Leadership and School Culture.

Limitations

Prior to discussing the conclusions and implications of this research study, a brief discussion of particular limitations of the findings is prudent. The schools and participants involved in this study were purposefully selected because of their availability to the researcher. Participants were included on a voluntary basis. The findings are not representative of all school leaders and teachers in each educational setting participating in this study.

The investigation was limited to four schools in a middle-class suburban district over a period of 5 months and did not examine any longitudinal aspect of the implementation. The primarily qualitative design included the researcher as a participant observer actively involved in the implementation of the Mathematics Curriculum Initiatives under investigation in this study. Analysis and findings are subject to the researcher's interpretations of the events.

For these reasons, the findings are unique to a particular set of schools and individuals during a particular period of time thus limiting the ability for generalization to other educational settings.

Discussion

What are the relationships between the implementation of mathematics curriculum initiatives; student achievement on state assessments; school culture; school leadership; and teacher's attitudes, beliefs, and concerns about test-driven accountability? The question addresses the interrelated and somewhat intangible factors linked to improving student achievement as the nation's public schools strive to meet the goal of the No Child Left Behind legislation by the year 2014. The following conclusions, based on this study's findings, underscore the significance of understanding individual school contextual factors influencing implementation of the district level curriculum initiatives designed to improve student achievement.

Conclusion and Implication One

Individual teacher's attitudes, beliefs, and concerns about improvement initiatives influence their classroom practices. This conclusion implies that the individual teacher should be the focal point of implementation for improvement initiatives. More specifically, individual teacher's perceptions of the improvement initiatives should be an integral part of the design and implementation of the initiatives intended to change classroom practices.

Previous research points to the autonomy teachers have in determining the content addressed in their classroom and the instructional strategies used to present that content (e.g., Fullan & Hargreaves, 1999; Goodlad, 1984; Ingersoll, 2003; Reeves, 2002). While one ethnographic study does not provide wide empirical support for facilitating educational change and reform, the findings of this study indicate that a teacher's attitudes, beliefs, and concerns about curriculum initiatives and test-driven accountability influence their determination about content and classroom practices. This conclusion is consistent with existing research supporting the Concerns-based Adoption Model conceptualized by Hall, Hord, and associates (e.g., Hall & Hord, 2001; Hord, Rutherford, Huling-Austin, & Hall, 1987) over 20 years earlier placing individual concerns about an innovation at the center of the implementation plan for that initiative.

In this study, individual teachers were the sole determining factor as to the degree to which students were exposed to the mathematics curriculum initiatives under investigation. Findings also indicate that there was a relationship between the degree to which the mathematics curriculum initiatives were implemented by teachers and improvements in state assessment scores. If teacher's attitudes, beliefs, and concerns influence implementation and implementation influences student achievement, then a key to improving student achievement is the complex interaction of the quality of the initiative and the individual teacher's perceptions of the merits of that initiative.

This conclusion has implications for future improvement initiatives rooted in the test-driven accountability system of NCLB. While the design of improvement initiatives at the district level is a starting point on the path to addressing student achievement, the determining factor as to whether the initiatives impact student achievement is centered on how the individual teacher perceives the merits of the initiatives based on their own unique set of attitudes, beliefs, and concerns. Many initiatives designed to improve student achievement will challenge teachers' preexisting beliefs requiring second order change to occur for successful implementation. The requirement of second order change for successful implementation has significant implications for the effective design of staff development and support during the implementation of improvement initiatives.

While the overall mission and goals of improvement initiatives can be presented to large groups of teachers, successful implementation will require that subsequent training and support focus on the individual teachers in their school and classroom environment. This shift in focus is consistent with recent research on the effectiveness of the staff development model involving Peer Coaching (e.g., Dantonio, 2001) as a means to address teacher's attitudes, beliefs, and concerns and ultimately improve classroom instructional practices.

Further implications of this conclusion have ramifications regarding each school's unique contextual environment. Specifically, if teacher's attitudes, beliefs, and concerns influence their decision regarding implementation of the improvement initiatives, then what factors influence teacher's attitudes, beliefs, and concerns? The following conclusions and implications address these factors influencing teacher's attitudes, beliefs, and concerns.

Conclusion and Implication Two

The local instructional subculture has significant influence on teacher's attitudes, beliefs, and concerns about improvement initiatives. Implications of this conclusion warrant greater attention by educational leaders to the development and nurturing of the forms of instructional subcultures that address individual teacher's concerns and promote implementation of the improvement initiative.

Findings of this study indicated that the teachers who did not belong to a collaborative team/grade level subculture within the schools had greater *Self Concerns* and lower levels of implementation of the mathematics curriculum initiatives. In contrast, teachers belonging to a collaborative team/grade level subculture exhibited higher *Impact Level* concerns on their Stages of Concern Questionnaire and demonstrated more advanced implementation of the mathematics curriculum initiatives.

The findings in this area in many ways parallel the work of Dufour and Eaker (1998) on Professional Learning Communities. The Team/Grade Level instructional subcultures found to influence teacher's attitudes, beliefs, and concerns and ultimately their classroom practice in this study exhibited a number of the characteristics of Professional Learning Communities. Dufour and Eaker describe Professional Learning Communities as small groups of educators who are committed to (1) a Shared Mission, Vision, and Values; (2) Collective Inquiry; (3) Working in Collaborative Teams; (4) Action and Experimentation; (5) Continuous Improvement; and (6) Student Learning. While the work on Professional Learning Communities does not specifically address the idea of teacher's attitudes, beliefs, and concerns, the concept implies a set of shared values and collaborative problem solving directed toward improving student achievement. These characteristics can be loosely aligned with the underlying notions of the Stages of Concerns progression indicating that the teacher will move from *Concerns* involving *Information, Personal,* and *Management* Issues to a more student-centered, *Collaborative* set of concerns about improvement initiatives (e.g., Hall & Hord, 2001).

This conclusion has implications for the implementation of future improvement initiatives. In combination with the first conclusion identifying teacher's attitudes, beliefs, and concerns as a significant influence on implementation, the potential ability of a local instructional subculture to influence teacher's attitudes, beliefs, and concerns is significant. Improvement initiatives designers and other educational leaders need not only concern themselves with the specific details of the particular improvement initiatives but also the school/grade/team level instructional setting to which the initiative will be introduced. The findings of this study suggest the undertaking of a more critical analysis of school culture to determine potential differences between instructional and non-instructional cultures. Does surface level collegiality and collaboration about social and non-academically activities mask isolation and individualism regarding instructional tasks? That is, a social culture of collegiality may not equate to an instructional culture of collaboration. The distinction may be the difference between the successful implementation of school improvement initiatives and their failure.

Educational settings marked by teacher isolation and fragmented instructional individualism present large obstacles for improvement initiatives. This assertion is not new or unique to the findings of this research study, as the positive effects of teacher collaboration, collegiality, and teamwork have been identified in the findings of previous research involving successful implementation of improvement initiatives (e.g., Goodlad, 1984; Heckman, 1987; Little, 1982; Louis & Miles, 1990).

Given the importance of addressing teacher's attitudes, beliefs, and concerns along with the apparent influence of the local instructional subculture on these concerns, the question arises as to what can be done to facilitate the development of the instructional subcultures more conducive to implementation and changing classroom practices. In part, the answer may lie in structures, characteristics, philosophies, and actions of school leadership elements.

Conclusion and Implication Three

Leadership in support of the improvement initiative within the local instructional subculture may have a significant influence on teacher's attitudes, beliefs, and concerns about the initiative. Implications of this conclusion for educational leaders point to a more distributed type of leadership within schools fostering not only overall school leadership support in relation to the improvement initiatives but more importantly, developing leadership within each instructional subculture of the school.

The findings in this study indicated a relationship between more advanced Stages of Concern (i.e., *Consequences* and *Collaboration*) and higher degrees of implementation when there existed a local team/grade level instructional leader in support of the Mathematics Curriculum Initiatives. More specifically, these team/grade level leaders need not have official titles and positions commonly associated with school leadership such as principal or department chairperson. The findings indicated that unofficial leaders working within team/grade level subcultures might be the key to addressing individual teacher's attitudes, beliefs, and concerns thereby facilitating implementation of improvement initiatives.

The characteristics exhibited by the unofficial team/grade level leaders in this study may be similar to what Hall and Hord (2001) describe as *Second Change Facilitators.* Working in cooperation with the *First Change Facilitator* (District Leadership, Principals, Department Chairperson, etc.), the *Second Change Facilitator* provides a more personal, day-to-day type of leadership support in the form of (1) reinforcement; (2) technical coaching; (3) monitoring progress of change; and (4) feedback and follow up (Hall & Hord, 2001). The findings in this study also allude to the development of an unofficial *Change Facilitator Team* (Hall & Hord, 2001) in the school with the greatest degree of implementation. Matching what Fullan (2001a) describes as *Knowledge Creation and Sharing*, official and unofficial leaders within this school met frequently to discuss, understand, plan, and adjust the implementation of the mathematics curriculum initiatives under investigation in this study.

This conclusion, in concert with the first two conclusions, has implications to educational leaders hoping to make significant change in schools to improve student achievement in the context of the NCLB legislation. Principals and other official school leaders may not have as much direct influence on individual teacher’s attitudes, beliefs, and concerns about a particular improvement initiative as they may have previously hoped. Instead, school leaders may need to focus more on developing a team of leaders focused on influencing the shared values of local instructional subcultures within the school. This idea is consistent with what has been described as Distributed Leadership (Elmore, 2000), Balanced Leadership (Waters, Marzano, & McNulty, 2003), and Loose-Tight Leadership (Dufour, Dufour, Eaker, & Karhanek, 2004) where the overview mission and vision are clear, yet paths to attain the goals may vary based on unique needs of individuals and different instructional subcultures.

Conclusion and Implication Four

While the conclusions in the area of leadership, school instructional culture, and teacher’s attitudes, beliefs, and concerns in concert with existing research begin to provide clarity to educational leaders on potential paths to successful implementation of improvement initiatives, the findings indicated that a significant obstacle to implementation remains.

The availability of time to plan, manage, communicate, and reflect on new ideas and practices remains a significant obstacle to the implementation of school improvement initiatives. Implications of this conclusion for educational leaders attempting to implement school improvement initiatives include the addition of another variable – the availability of teacher time - to the complex interrelated mix within the contextual school environment.

Findings in this study indicated that the availability of the additional time required to implement the mathematics curriculum initiatives influenced teacher's attitudes, beliefs, and concerns about the initiatives. While a number of teachers exhibited *Management Concerns* on their *Stages of Concern Profile*, others demonstrated periodic regression from the more advanced *Impact Concern Stages* back to *Management Concerns* as they struggled to manage the ever-changing time requirements of both professional and personal priorities. Moreover, the team/grade level leaders identified in the findings as a critical component within the team/grade level instructional subculture exhibited similar *Availability of Time* issues as these leaders also maintained full classroom teaching responsibilities.

Though the lack of time in the teacher work environment is not a new variable, the issue remains somewhat dormant and unresolved in the recent school improvement movement. The issue of available teacher time to implement an educational innovation is a subtle but common theme throughout the conceptual and empirical literature over the past 20 years. Hall (1991) argues that additional responsibilities added to the teachers' already overloaded schedules would cause even well-designed initiatives to fail. Case in point, a significant amount of literature involving the integration of learning technology into teachers' daily instructional practices identifies the lack of time to implement such new technology-based instructional practices as a continuing barrier to successful technology integration (e.g., Cuban, 2001; Leggitt & Persichitte, 1998; U.S. Office of Science and Technology Policy, 1997).

In a more general discussion, Reeves (2002) proposed the *Law of Initiative Fatigue* stating that the effectiveness of an initiative is a function of *available time*, available resources, and the number of concurrent initiatives being implemented in the system. Examples of this *Fatigue* were apparent in the findings of this research study as multiple initiatives in the schools competed for the limited available time remaining as teachers coordinated other professional and personal responsibilities and priorities.

The conclusion in this area implies that a school, its leaders, and the staff can only manage a limited number of concurrent initiatives if quality implementation is to be achieved. District and School Leaders need to examine the time requirement and alignment of new initiatives. If possible, distribute the responsibility and time requirement to different teacher groups within the school or over different periods of time during the school year.

Implications of this conclusion call for a closer examination of individual teacher workday responsibilities. If developing collaborative instructional subcultures driven by dedicated teacher leaders can influence teacher's attitudes, beliefs, and concerns toward the goal of implementation of improvement initiatives, then what daily tasks assigned to teachers hinder the development of such collaborative subcultures? Simply stated, would we rather have teachers spend 45 minutes a day in cafeteria duty or spend 45 minutes a day collaboratively discussing, planning, and adjusting instructional practice to better address the achievement needs of academically at-risk students?

Alternatively, are we asking the wrong questions? Instead of reprioritizing teacher responsibilities within the present school structure, maybe a more systemic restructuring is the answer. Such restructuring would be one that moves beyond simple first order change ideas and examines the foundations of the present structure in the search to provide time for meaningful collaboration, reflection, and implementation of Best Practices. Unfortunately, this question is rarely addressed in what is a limited resource public educational system in most areas.

With specific conclusions and implications in place, this study’s broader significance to educational leaders and future improvement initiatives is discussed in the following section.

Significance of the Study for Future Research and Practice

This study's findings and conclusions extend the existing knowledge regarding the complex, interrelated factors influencing teacher implementation of the curriculum initiatives designed to improve student achievement in the context of the NCLB's test-driven accountability environment. The findings of this study call attention to the need for educational leaders to not only allot time and resources to the design of improvement initiatives but also to the implementation of the initiative. Specifically, the progress of implementation of the initiatives may differ substantially from school to school, requiring varied implementation strategies in each educational setting.

This study has implications for future educational research as additional questions emerge from the findings and conclusions. In the area of teacher isolation versus membership in a collaborative instructional subculture, can a school be effective for all students with fragmented, individualistic instructional cultures? Is the existence of functioning Professional Learning Communities (Dufore & Eaker, 1998) a litmus test for successful implementation of school improvement initiatives? While there is much conceptual literature on the establishment and successes of Professional Learning Communities, an understanding of the day-to-day workings of such a community is lacking. Additional, in-depth, ethnographic investigations are needed in this area to provide educational leaders with clearer models and best practices in facilitating the development of such communities. In addition, further investigation is needed into understanding the emergence of the unofficial leaders involved in sustaining the work of such groups.

Finally, the study adds clarity along the path to attaining the goal of improving achievement for all students. The preliminary conceptual framework established in Chapter 2 (Figure 14, p. 82) illustrated what now appears to be an over-simplistic representation of the influences of leadership, school culture, and teacher's attitudes, beliefs, and concerns on the implementation phase of the adoption process. Figure 25 represents a visual synthesis of the findings and conclusions in this study of the factors affecting the implementation of the curriculum initiatives in today's test-driven accountability environment. As depicted in Figure 25, the study reestablishes the foundations of the Concerns-based Adoption Model (Hall & Hord, 2001; Hall, Wallace, & Dossett, 1973) placing individual teacher's attitudes, beliefs, and concerns as the ultimate determining factor as to whether or not improvement initiatives get implemented in the classroom. This study illustrates how a better understanding of the factors within the school context that influence teacher's attitudes, beliefs, and concerns can strengthen the implementation of improvement initiatives and ultimately impact student achievement.

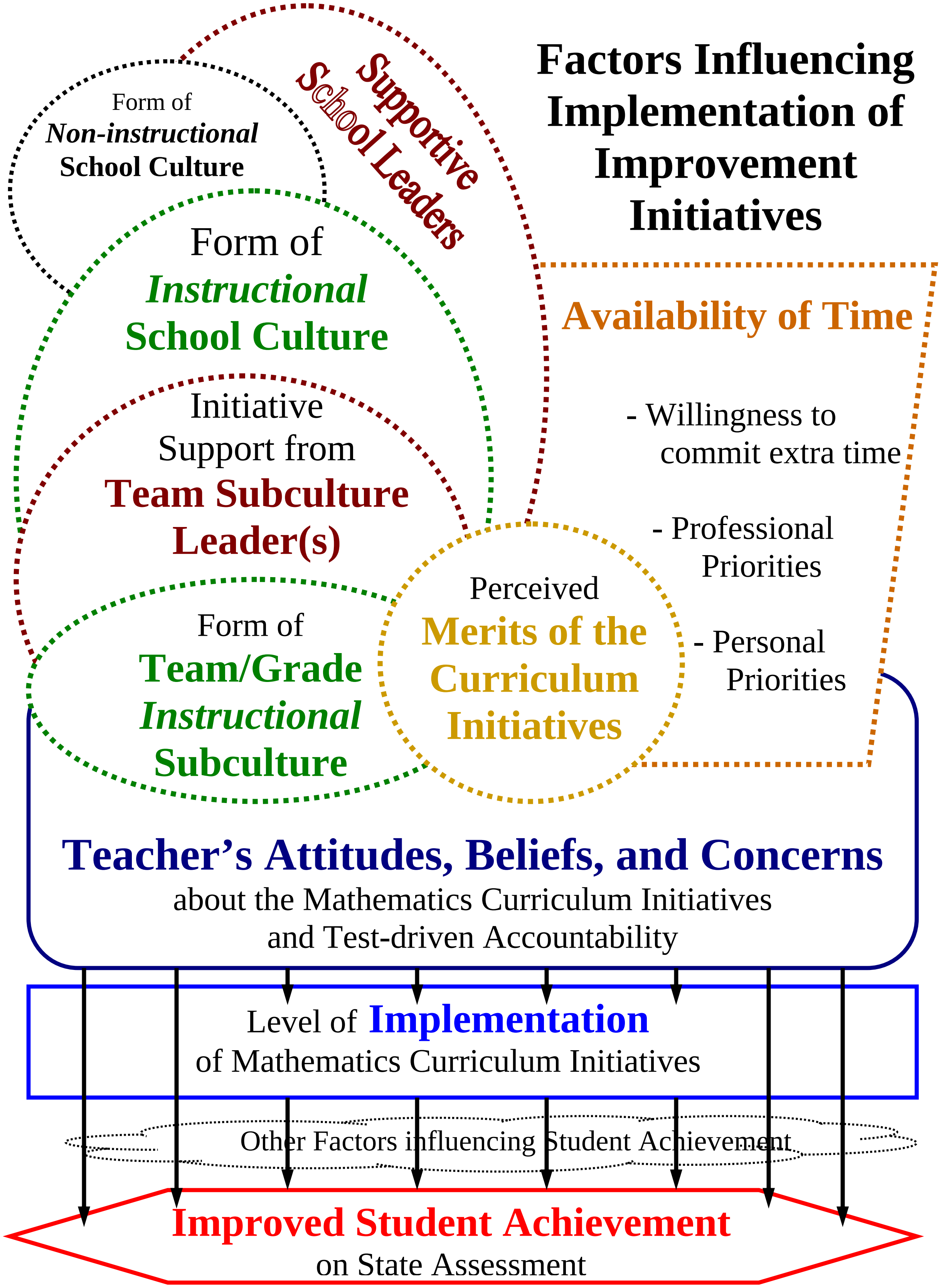


Figure 25. Synthesis of Factors Influencing Implementation of Improvement Initiatives.

Furthermore, the findings and conclusions in the area of leadership and school culture underscore the significance and add clarity to one of the six standards set forth by the Educational Leadership Constituent Council (ELCC) for Principal Leadership. The council states, “A school administrator is an educational leader who promotes the success of all students by advocating, nurturing, and sustaining a school culture and instructional program conducive to student learning and staff professional growth” (Wilmore, 2002, p. 32). Through the standards, the ELCC establishes the Mission, Vision, and Goal for effective school leadership. The significance and ultimate contribution of this study is to provide those leaders with a better understanding of how to achieve the ELCC standard as they “promote success of all students” in the test-driven accountability context of No Child Left Behind.

The realization of the goal of the ELCC standard lies in a complex blend of factors involving teachers, school leaders, and school culture. The key is the engagement of all staff in the common mission of promoting the success of all students. School leaders must foster the engagement of others by allocating the resources required, in the form of time and money, to empower teacher leaders and collaborative instructional teams as they implement improvement initiatives and affect change in their classrooms.

The ELCC standards point leaders to the destination. The findings and conclusions of this study simply add clarity to the map used to arrive at that destination of improving the achievement of all students regardless of their individual circumstances and background.

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Appendix A

Data Collection Overview

Area to be Measured	**Research Questions**	**Collection Instrument**	**Collection Procedures**	**Framework Used**	**Triangulation**
Teacher's Attitudes, Beliefs, and Concerns about Test-driven Accountability	RQ #1 RQ #3 RQ #4 RQ #5	Participant Observer	Informal Teacher Observations Informal Teacher Interviews	CBAM Model Stages of Concern Framework	Multiple Instruments Multiple Procedures Questionnaire's Independent Validity
		Questionnaire	Teachers Stages of Concern Questionnaire	Questionnaire's Framework	
School Culture	RQ #5	Participant Observer	Informal Observations Informal Teacher Interviews	Hargreave's Forms and Content of School Culture	Multiple Sources Multiple Procedures
Leadership Factors	RQ #4	Participant Observer	Informal Leader Observations Informal Teacher and Leader Interviews	Fullan's Leadership Model	Multiple Sources Multiple Instruments Multiple Procedures
Teacher Implementation of Initiatives	RQ #1 RQ #2	Participant Observer	Informal Classroom Observations Informal Teacher Interviews	CBAM Model Level of Use Framework	Multiple Sources Multiple Procedures
Student Achievement	RQ #2 RQ #3	Document Retrieval	2004 (prior) PSSA Scores 2005 (post) PSSA Scores	State Assessment	Assessment's Independent Validity

Appendix B

Stages of Concern Description

Broad Stage	**Stage of Concern**	**Description**
Impact	Refocusing	The focus is on the exploration of more universal benefits from the innovations, including the possibility of major changes or replacement with a more powerful alternative. Individual has definite ideas about alternatives to the proposed or existing form of innovation
Impact	Collaboration	The focus is on coordination and cooperation with others regarding use of the innovation
Impact	Consequence	Attention focuses on impact of the innovation on clients in his or her immediate sphere of influence. The focus is on relevance of the innovation.
Task	Management	Attention is focused on the processes and tasks of using the innovation and the best use of information and resources. Issues related to efficiency, organizing, managing, scheduling, and time demands are utmost.
Self	Personal	Individual is uncertain about the demands of the innovation, his/her inadequacy to meet those demands, and his/her role with the innovation. This includes analysis of his/her role in relation to the reward structure of the organization, decision-making, and consideration of potential conflict with existing structures or personal commitment. Financial or status implications of the program for self and colleagues may also be reflected.
Self	Informational	A general awareness of the innovation and interest in learning more details about it is indicated. The person seems to be unworried about himself/herself in relation to the innovation. She/he is interested in substantive aspects of the innovation in selfless manner, such as general characteristics, effects, and requirements for use.
---	Awareness	Little concern about or involvement with the innovation is indicated.

Note. Compiled from Hall, G. E., George, A. A., & Rutherford, W. A. (1998). *Measuring stages of concern about the innovation: A manual for use of the SOC questionnaire*. Austin, TX: University of Texas at Austin, Research and Development Center for Teacher Education

Appendix C

Stages of Concern Questionnaire

Not Applicable-Not True for Me Now-Somewhat True for Me Now-Very True for Me
0------------1------------2------------3-------------4--------------5------------6-------------7

1	I am concerned about students' attitudes toward the PSSA Initiatives.
2	I now know of some other approaches that might work better than the use of the present PSSA initiatives.
3	I don't know what the PSSA Initiatives entail.
4	I am concerned about not having enough time to organize myself each day without incorporating the PSSA Initiatives.
5	I would like to help other faculty in their understanding and implementation of the PSSA Initiatives
6	I have a very limited knowledge about the PSSA Initiatives.
7	I would like to know the effect of the PSSA Initiatives on my professional status.
8	I am concerned about conflict between my interests and my responsibilities regarding the PSSA Initiatives.
9	I am concerned my use of the PSSA Initiatives.
10	I would like to develop working relationships with my faculty or outside faculty about these PSSA Initiatives.
11	I am concerned about how the PSSA Initiatives affects students.
12	I am not concerned about the PSSA Initiatives.
13	I would like to know who is making the decisions regarding the district's PSSA Initiatives.
14	I would like to discuss the possibility of incorporating the PSSA Initiatives.
15	I would like to know what resources are available if we decide to use the PSSA Initiatives in my classroom/IOP.
16	I am concerned about managing all that the PSSA Initiatives require.
17	I would like to know how my teaching is supposed to change given the PSSA Initiatives.

Note. Adapted from *Implementing Change: Patterns, Principles, and Potholes* (p. 230-231) by G. E. Hall & S. M. Hord, 2001, Boston: Allyn and Bacon.

Appendix C
(continued)

Not Applicable-Not True for Me Now-Somewhat True for Me Now-Very True for Me
0------------1------------2------------3-------------4-------------5------------6-------------7

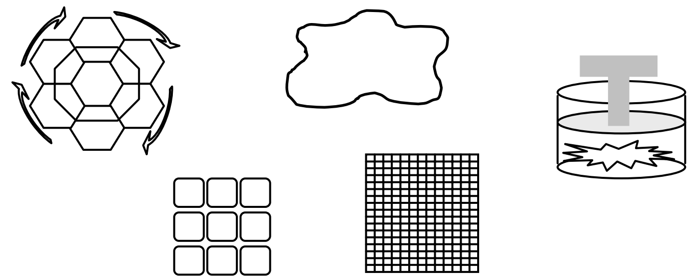
18	I would like to familiarize other departments/persons with my progress of these PSSA Initiatives.
19	I am concerned about evaluating the impact on students.
20	I would like to revise the instructional approach of the PSSA Initiatives.
21	I am completely occupied with other things.
22	I would like to modify our PSSA Initiatives based on the experiences of our students.
23	Although I don't full understand the PSSA Initiatives, I am concerned about issues in the area.
24	I would like to excite my students about their part in these PSSA Initiatives.
25	I am concerned about time spent working with nonacademic problems related to the PSSA Initiatives.
26	I would like to know what the PSSA Initiatives will require in the immediate future.
27	I would like to coordinate my effort with others to maximize the PSSA Initiatives' effects.
28	I would like to have more information on time and energy commitments required by the PSSA Initiatives.
29	I would like to know what other faculty are doing in the PSSA area.
30	At this time, I am not interested in learning about the PSSA Initiatives.
31	I would like to determine how to supplement, enhance, or replace these PSSA Initiatives.
32	I would like to use feedback from students to change the design of the PSSA Initiatives.
33	I would like to know how my role will change because of the PSSA Initiatives.
34	Coordination of tasks and people surrounding the PSSA Initiatives is taking too much of my time.
35	I would like to know how these PSSA Initiatives are better than what we did in the past.

Note. Adapted from *Implementing Change: Patterns, Principles, and Potholes* (p. 230-231) by G. E. Hall & S. M. Hord, 2001, Boston: Allyn and Bacon.

Appendix D

School Culture Observation Framework

Form of School Culture
Collaborative Culture
Moving Mosaic
Contrived Collegiality
Balkanization
Fragmented Individualism



Note. From Changing Teachers, Changing Times (p. 238) by A. Hargreaves, 1994, London: Casell. Copyright 1994 by Andy Hargreaves. Reprinted with Permission of the publisher.

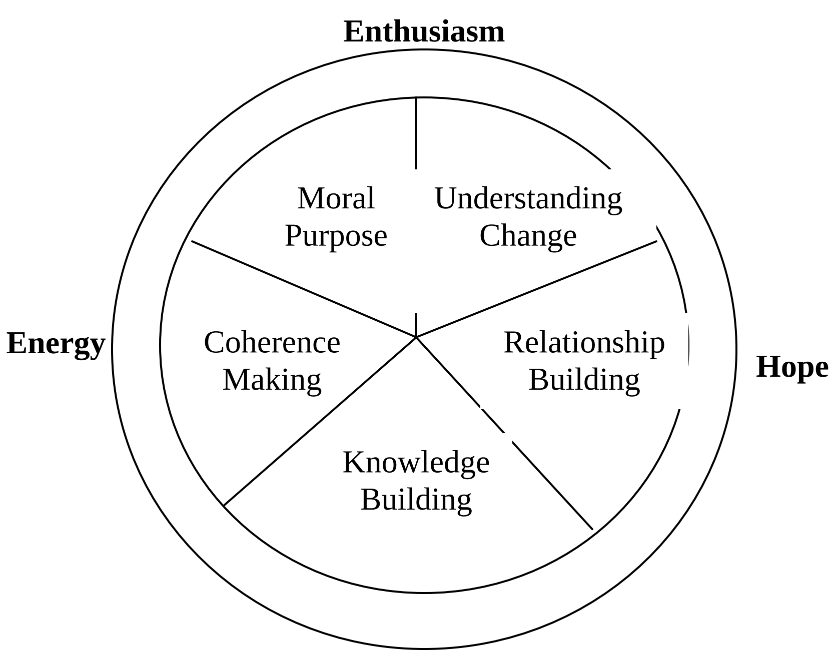
Content of School Culture	**SCALE**		
Collegiality	Always	Sometimes	Never
Experimentation	Always	Sometimes	Never
High Expectations	Always	Sometimes	Never
Trust and Confidence	Always	Sometimes	Never
Tangible Support	Always	Sometimes	Never
Reaching Out to the Knowledge Bases	Always	Sometimes	Never
Appreciation and Recognition	Always	Sometimes	Never
Caring, Celebration, and Humor	Always	Sometimes	Never
Involvement in Decision Making	Always	Sometimes	Never
Traditions	Always	Sometimes	Never
Honest, Open Communication	Always	Sometimes	Never
Protection of What's Important	Always	Sometimes	Never

Note: Compile from Saphier, J. & King, M. (1985). Good seeds grow in strong cultures. *Educational Leadership*, 42(6), 67-74.

Appendix E

Fullan's Leadership Framework
Observations and Interviews

Components of Effective Leadership	**SCALE**		
Moral Purpose	Always	Sometimes	Never
Understanding of the Change Process	Always	Sometimes	Never
Relationship Building	Always	Sometimes	Never
Knowledge Creation and Sharing	Always	Sometimes	Never
Coherence Making	Always	Sometimes	Never
Energy – Enthusiasm – Hope	Always	Sometimes	Never



Note. From *Leading in a Culture of Change* (p. 4) by M. Fullan, 2001, San Francisco : Jossey-Bass. Copyright 2001 by John Wiley & Sons, Inc. Reprinted with Permission of the publisher.

Appendix F

Levels of Use Framework

Broad Level	**Level of Use**	**Description**
Users	Renewal	State in which the teacher re-evaluates the quality of use of the innovation, seeks major modifications of or alternatives to present innovation to achieve increased impact on students, examines new developments in the field, and explores new goals for self and the system.
Users	Integration	State in which the teacher is combining their own efforts to use the innovation with related activities of colleagues to achieve a collective impact on students within their common sphere of influence.
Users	Refinement	State in which the teacher varies the use of the innovation to increase the impact on students within their immediate sphere of influence. Variations are based on knowledge of both short- and long-term consequences for students.
Users	Routine	Use of the innovation is stabilized. Few, if any, changes are being made in ongoing use. Little preparation or thought is being given to improving innovation use or its consequences.
Users	Mechanical Use	State in which the teacher focuses most effort on the short-term, day-to-day use of the innovation with little time for reflection. Changes in use are made more to meet teacher needs than student needs. The teacher is primarily engaged in a stepwise attempt to master the tasks required to use the innovation, often resulting in disjointed and superficial use.
Nonusers	Preparation	State in which the user is preparing for first use of the innovation.
Nonusers	Orientation	State in which the teacher has recently acquired or is acquiring information about the innovation and/or has recently explored or is exploring its value orientation and its demands upon teachers and the district/school.
Nonusers	Nonuse	State in which the user has little or no knowledge of the innovation, no involvement with the innovation, and is doing nothing toward becoming involved.

Note: Compiled from Loucks, S. F., Newlove, B. W., & Hall, G. E. (1998). *Measuring levels of use of the innovation: A manual for trainers, interviews, and raters.* Austin, TX: University of Texas at Austin, Research and Development Center for Teacher Education.

Appendix G

Informal Interview Primer Questions

On School Culture:

- Have you talked to <another teacher’s name> about trying xxx?
- What have you tried in your Math Classes/IOP Periods?
- Do you think we’re going to be able to raise student PSSA scores?
- Do you feel like you are involved in the decision-making process regarding the implementation of these initiatives?
- Does the staff discuss student achievement on a regular basis?
- Does the staff work together to solve problems?
- What are the topics of discussion at faculty meetings?

On Leadership:

- Do you feeling involved in the school’s decision-making process?
- Has the principal discussed the PSSA Initiatives with you/your team/your department?
- Who provides the most instructional support for you?
- Do you have a positive working relationship with <instructional leaders>?
- Does the <instructional leader> understand your concerns?
- Does <instructional leader> provide positive support and encouragement?
- Are curriculum and student achievement topics of discussion with <instructional leader>?

Appendix G
(continued)

Informal Interview Primer Questions

On Teacher's attitudes, beliefs, and concerns:

- What do you see as the biggest obstacles to implementing these initiatives?
- Do you believe the initiatives will be successful in improving student PSSA scores?
- Are the goals of NCLB/PSSA in line with your goals as an educator?
- Have you looked at the PSSA Mathematic Resources?
- Would you like to know more about the district's initiatives?
- Are these curriculum initiatives the best way to use the district's resources?
- Are you working with or discussing your use of these initiatives with other members of the staff?
- What other activities/responsibilities are you involved in at school? (Coaching/Clubs/Student Assistant/Etc)
- What other curriculum initiatives are you involved in this year?
- How would you improve the curriculum initiatives?
- Describe the mathematics curriculum initiatives in your own words.
- How have these initiatives changed your workday or classroom instruction?

Broad/Open Conversation Starters:

- How are your classes going since we have last spoken?
- What is new with you?
- What is new at <school name>

Appendix H

Informal Interview/Conversation

Name:	

Date:	

Position:	

School:	

Topic:	

Description of Interaction	Coding

Researcher's Comments	Coding

Appendix H
(continued)

Informal Observation

Name:	

Date:	

Position:	

School:	

Topic/Area of Observation:	

Description of Observation:	Coding

Researcher's Comments	Coding

Appendix I

Preliminary Coding

CATEGORY	SUBCATEGORY	CODES	
Teacher's Attitudes, Beliefs, and Concerns	Awareness	SOC-Aw	SOC-0
Teacher's Attitudes, Beliefs, and Concerns	Informational	SOC-Info	SOC-Self
Teacher's Attitudes, Beliefs, and Concerns	Personal	SOC-Pers	SOC-Self
Teacher's Attitudes, Beliefs, and Concerns	Management	SOC-Mang	SOC-Task
Teacher's Attitudes, Beliefs, and Concerns	Consequence	SOC-Con	SOC-Impact
Teacher's Attitudes, Beliefs, and Concerns	Collaboration	SOC-Collab	SOC-Impact
Teacher's Attitudes, Beliefs, and Concerns	Refocus	Soc-Ref	SOC-Impact
CATEGORY	**SUBCATEGORY**	**CODE**	
Leadership	Moral Purpose	Lead-MP	
Leadership	Understanding Change	Lead-Change	
Leadership	Relationships	Lead-Rel	
Leadership	Knowledge Creation and Sharing	Lead-KB	
Leadership	Coherence Making	Lead-CM	
CATEGORY	**SUBCATEGORY**	**CODE**	
Implementation Level	Renewal	LoU-Ren	
Implementation Level	Integration	LoU-I	
Implementation Level	Refinement	LoU-Ref	
Implementation Level	Routine	LoU-Rot	
Implementation Level	Mechanical Use	LoU-M	
Implementation Level	Preparation	LoU-Prep	
Implementation Level	Orientation	LoU-O	
Implementation Level	Nonuse	LoU-Non	

Appendix I
(continued)

CATEGORY	SUBCATEGORY	CODE
Form of School Culture	Collaborative Culture	SCF-CC
Form of School Culture	Moving Mosaic	SCF-MM
Form of School Culture	Contrived Collegiality	SCF-Con
Form of School Culture	Balkanization	SCF-BK
Form of School Culture	Fragmented Individualism	SCF-FI
Content of School Culture	Collegiality	SCC-Col
Content of School Culture	Experimentation	SCC-Exp
Content of School Culture	High Expectations	SCC-HE
Content of School Culture	Trust and Confidence	SCC-TC
Content of School Culture	Tangible Support	SCC-Sup
Content of School Culture	Reaching Knowledge Base	SCC-KNL
Content of School Culture	Appreciation and Recognition	SCC-A&R
Content of School Culture	Caring, Celebration, and Humor	SCC-CCH
Content of School Culture	Involvement in Decision Making	SCC-DM
Content of School Culture	Protection of What’s Important	SCC-WI
Content of School Culture	Traditions	SCC-Trad
Content of School Culture	Honest, Open communication	SCC-Com

Appendix K

Data Analysis Overview

Area of Measurement	Anticipatory Analysis	During Collection Analysis	Post Collection Analysis	Holistic Analysis
Research Question #1: How did teacher's attitudes, beliefs, and concerns about test-driven accountability relate to the implementation of mathematics curriculum initiatives?				
Teacher's Concerns	Stages of Concern Framework	Generate Categories and Coding	Develop Individual Concerns Profiles	Identify Patterns and Themes and Search for Alternate Explanations
Implementation Levels	Levels of Use Framework	Generate Categories and Coding	Develop Individual Levels of Use Profile	
Research Question #2: How did a teacher's implementation of mathematics curriculum initiatives relate to student achievement on state assessments?				
Implementation Level	Levels of Use Framework	Generate Categories and Coding	Develop Individual Levels of Use Profile	Identify Patterns and Themes and Search for Alternate Explanations
Student Achievement	None	None	Compile Pre and Post PSSA Scores for each Teacher	
Research Question #3: How did teacher's attitudes, beliefs, and concerns about test-driven accountability relate to student achievement on state assessment?				
Teacher's Concerns	Stages of Concern Framework	Generate Categories and Coding	Develop Composite School Concerns Profiles	Identify Patterns and Themes and Search for Alternate Explanations
Student Achievement	None	None	Compile Pre and Post PSSA Scores for each School	
Research Question #4: What was the influence of principal and curriculum leadership's influence on teachers' attitudes, beliefs, and concerns?				
Leadership	Fullan's Framework of Leadership	Generate Categories and Coding	Develop Composite School Leadership Profiles	Identify Patterns and Themes and Search for Alternate Explanations
Teacher's Concerns	Stages of Concern Framework	Generate Categories and Coding	Develop Composite School Concerns Profiles	
Research Question # 5: What was the influence of school culture on teachers' attitudes, beliefs, and concerns?				
School Culture	Hargreaves' Form & Content	Generate Categories and Coding	Develop School Culture Profile	Identify Patterns and Themes and Search for Alternate Explanations
Teacher's Concerns	Stages of Concern Framework	Generate Categories and Coding	Develop Composite School Concerns Profiles	

Appendix L

District Permission to Conduct Research Study

Appendix M
Invitation to Participate in the Research Study

Dear Colleague,

As a doctoral candidate at Drexel University, I am preparing to conduct a research study to fulfill the dissertation requirement of the School of Education's Ph.D. Program. The study is titled: *Teacher Implementation of Mathematics Curriculum Initiatives in a Test-Driven Accountability Environment: An Ethnographic Investigation into Leadership; School Culture; and Teacher's Attitudes, Beliefs, and Concerns.* Mr. Wilson has granted me permission to conduct this research study in Neshaminy's four middle schools.

Over a three-month period of time, I will be collecting information through informal observations, informal interviews, and a questionnaire about school culture, instructional leadership and teacher's attitudes, beliefs, and concerns about the PSSA Mathematics Curriculum Initiative implemented this school year. The study will not evaluate teachers, leaders, or the schools; instead, the goal is to identify themes and patterns in the abovementioned categories that may be related to implementation and PSSA scores. The results will be reported to Drexel's academic community and housed in its library.

As an educator who has been professionally involved in the district's PSSA curriculum initiatives, I would like to invite you to participate in this study. Your time commitment is minimal, as most of the collection data will occur during the course of our normal working routine. You may be asked to complete a 35-question questionnaire asking you about the PSSA curriculum initiatives.

Your participation is completely voluntary. I have asked over 35 teachers, administrators, and instructional leaders in the district to participate in the study. Confidentiality is assured as all the results will be reported anonymously without identifying participants, schools or even the district. Your choice to participate or not will also be kept confidential.

In order to eliminate any potential coercion to participate, I will not initiate further discussion about your participation beyond this letter. I will be happy to discuss the study's goals, methods and procedures with you prior to your decision to participate but those discussions will need to be initiated by you. Moreover, if you do choose to participate in the study, your participation can be discontinued at any time at your request.

If you would like to participate in this research study, please complete the attached Informed Consent Form after reading it carefully. The form is part of Drexel University's Institutional Review Board process designed to ensure full disclosure and the ethical treatment of research participants.

Sincerely,
Rob McGee

Appendix N

Informed Consent Form

DREXEL UNIVERSITY
CONSENT TO TAKE PART IN A RESEARCH STUDY

1. **PARTICIPANT'S NAME: ____**

2. **TITLE OF RESEARCH:**
   Teacher Implementation of Mathematics Curriculum Initiatives in a Test-Driven Accountability Environment: An Ethnographic Investigation into Leadership; School Culture; and Teacher's Attitudes, Beliefs, and Concerns

3. **INVESTIGATORS' NAMES**: Dr. Sheila Vaidya and Robert McGee

4. **CONSENTING FOR THE RESEARCH STUDY:**
   This is a long important document. If you sign it, you will be authorizing Drexel University and its researchers to perform a research study on you. You should take your time and carefully read it. You can also take a copy of this consent form and discuss it with a family member, attorney, or anyone else you would like before you sign it. Do not sign it unless you are comfortable with participating in the study.

5. **PURPOSE OF RESEARCH:**
   You are being asked to participate in a research study. This research is being conducted as part of a Ph.D. dissertation requirement at Drexel University. The purpose of the study is to investigate the influence of Teacher's Attitudes, Beliefs, and Concerns; School Culture; and Instructional Leadership on the Implementation of the Mathematics Curriculum Initiatives and Student Achievement on the Mathematics portion of Pennsylvania's System of School Assessment (PSSA) exam.

   Over a three-month period beginning in the spring of 2005, the researcher – as a participant observer – will collect data to uncover patterns and themes in the above mentioned areas as they relate to implementation of the Mathematics Curriculum Initiative in the district's four middle schools. You, along with approximately 35 other individuals, have been asked to participate in this research study because of your current professional involvement with one or more of the following: (1) You deliver Eighth Grade Mathematics Instruction; (2) Your professional involvement with Middle School PSSA Tutor/Coach; (3) Your position as Instructional Leader in the district, school, or team; or (4) Your involvement in District/School PSSA Improvement initiatives.

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(continued)

6. PROCEDURES AND DURATION:

Duration and Frequency of Data Collection

The researcher will visit each building one day a week for a period of seven hours over the course of three months. Each building will receive between 10 and 12 visits during the data collection window.

Data Collection Procedures for Regular Education and Special Education Teachers of Mathematics

The following data collection procedures will take place over the three month period:

(1) A 35-question Stages of Concern Questionnaire. This questionnaire will be administered during the first month of the data collection window requiring approximately 30 minutes to complete. The survey may be completed in school or at home at your convenience.

(2) Informal interviews with the researcher about your attitudes, beliefs, and concerns regarding the District PSSA Curriculum Initiatives; your school's professional culture; and instructional leadership. The vast majority of the informal interviews will not be scheduled events; instead, they will occur in the course of the normal working interactions with the researcher. The frequency and duration of the informal interviews will also vary based on the natural interaction between yourself and the researcher.

(3) Informal observations and interviews regarding your implementation of Mathematics PSSA Curriculum Initiatives. Again, the collection of this data will not be scheduled or have a set frequency or duration; instead, it will be gathered during the normal working interactions with the researcher.

Data Collection Procedures for Principals, Department Chairs, Reading Specialists and other unofficial leaders

The following data collection procedures will take place over the three month period:

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(continued)

(1) Informal interviews with the researcher about your attitudes, beliefs, and concerns regarding District PSSA Curriculum Initiatives and your school's professional culture. The vast majority of the informal interviews will not be scheduled events; instead, they will occur in the course of the normal working interactions with the researcher. The frequency and duration of the informal interviews will also vary based on the natural interaction between yourself and the researcher.

(2) Informal observations in the area of instructional leadership. Again, the collection of this data will not be scheduled or have a set frequency or duration; instead, it will be gathered during the normal working interactions with the researcher.

Overall, your experience as a participant in this research study will not be significantly different from your normal work environment. The data collection procedures are designed to be unobtrusive and you need only interact with the researcher as you see fit based on your professional availability.

7. RISK AND DISCOMFORT/CONSTRAINTS:

The informal observation and interview procedures established in this research study have been designed to expose participants to minimal risk and discomfort. The types of activities to be performed in the course of this research are consistent with tasks the teachers and school leadership are expected to perform in their normal working environment.

8. BENEFITS:

It is not likely that participants in this research study will receive any direct benefits from their participation. It is hoped that the findings of the research study will help educational leaders and policymakers better understand the implementation process of mathematics curriculum initiatives resulting from the adoption of the No Child Left Behind legislation.

9. REASONS FOR REMOVAL FROM THE STUDY

You may be required to stop your participation in the research study before the end for any of the following reasons:

(1) The district decides to discontinue the study
(2) The building principal decides to discontinue the study
(3) The researchers decide to discontinue the study
(4) You fail to adhere to the requirement for participation established in this consent form

Appendix N
(continued)

10. VOLUNTARY PARTICIPATION:

Participation in this study is voluntary. You can choose not to be involved in the study at this point or if you decide to participate now, you may end your participation at any point in the future. Additionally, your choice to participate or not will not be disclosed by the researcher to other members of the school.

11. RESPONSIBILITY FOR COST:

The researcher will be solely responsible for any costs related to the research study.

12. IN CASE OF INJURY:

If you have any questions or believe you have been injured in any way by being in this research study, you should contact Dr. Vaidya at telephone number (215) 895-6690. However, neither the investigators nor Drexel University will make payment for injury, illness, or other loss resulting from your participation in this research project. If you are injured by this research activity, medical care including hospitalization is available, but may result in costs to you or your insurance company because the University does not agree to pay for such costs. If you are injured or have an adverse reaction, you should also contact the Office of Research Compliance at 215-762-3453.

13. CONFIDENTIALITY:

All data obtained in this research study will be kept confidential. In any publication or presentation of research findings, your identity along with your school's will be kept confidential. There is a possibility that records that identify you may be inspected by authorized individuals such as Drexel's Institutional Review Board and employees conducting peer review activities. I consent to such inspections and to the copying of excerpts from my data records, if required by any of these representatives.

14. OTHER CONSIDERATIONS:

If new information becomes known that will affect you or might change your decision to be in this study, you will be informed by the researcher. If you have any questions at any time about your rights as research subjects you may contact Dr. Sheila Vaidya at (215) 895-6690, Rob McGee at (609) 304-4734, or the Office of Research Compliance at (215) 762-3453.

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15. CONSENT:

Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a test subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities.

- I have been informed of the reasons for this study.
- I have had the study explained to me.
- I have had all of my questions answered.
- I have carefully read this consent form, have initialed each page, and have received a signed copy.
- I gave consent voluntarily.

____ ____________

Participant Date

____ ____________

Researcher Date

____ ____________

Witness of Signature (if applicable) Date

15. LIST OF INDIVIDUALS AUTHORIZED TO OBTAIN CONSENT:

Name	***Title***	***Day Number***	***24-hour Number***
Dr. Sheila Vaidya	Associate Professor School of Education Drexel University	(215) 895-6690	(215) 895-6690
Mr. Robert McGee	Ph.D. Candidate Drexel University	(609) 304-4734	(609) 265-2027

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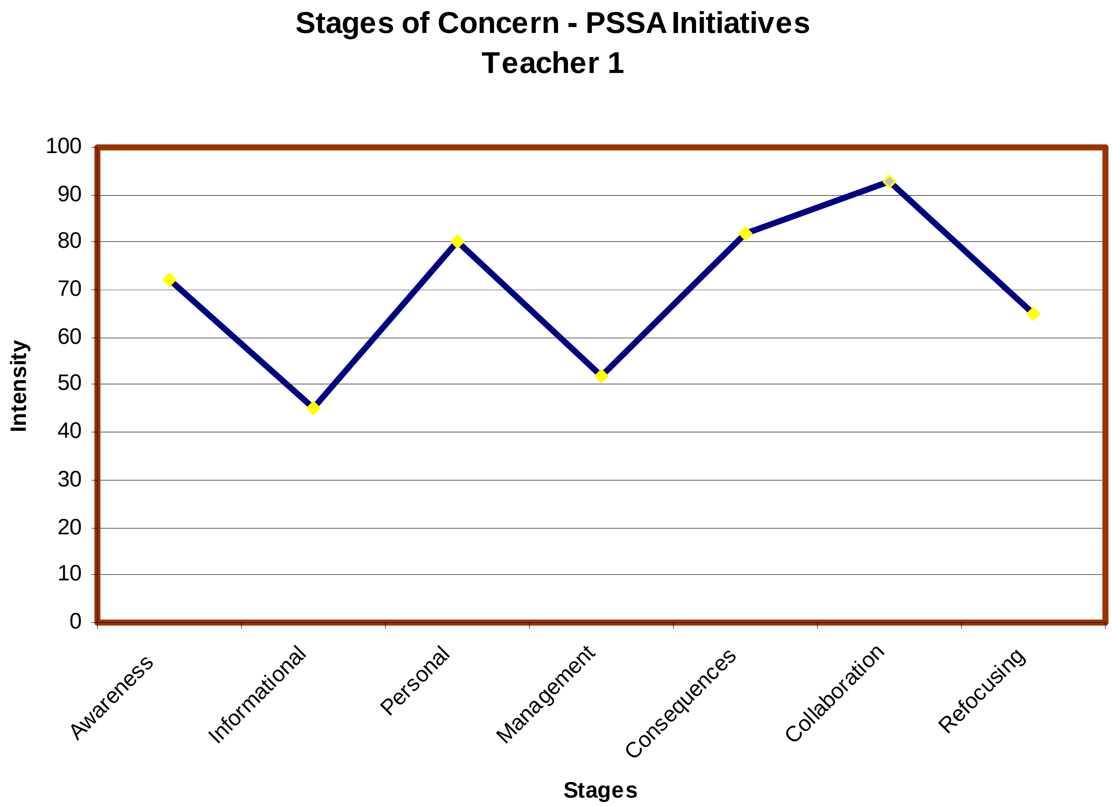
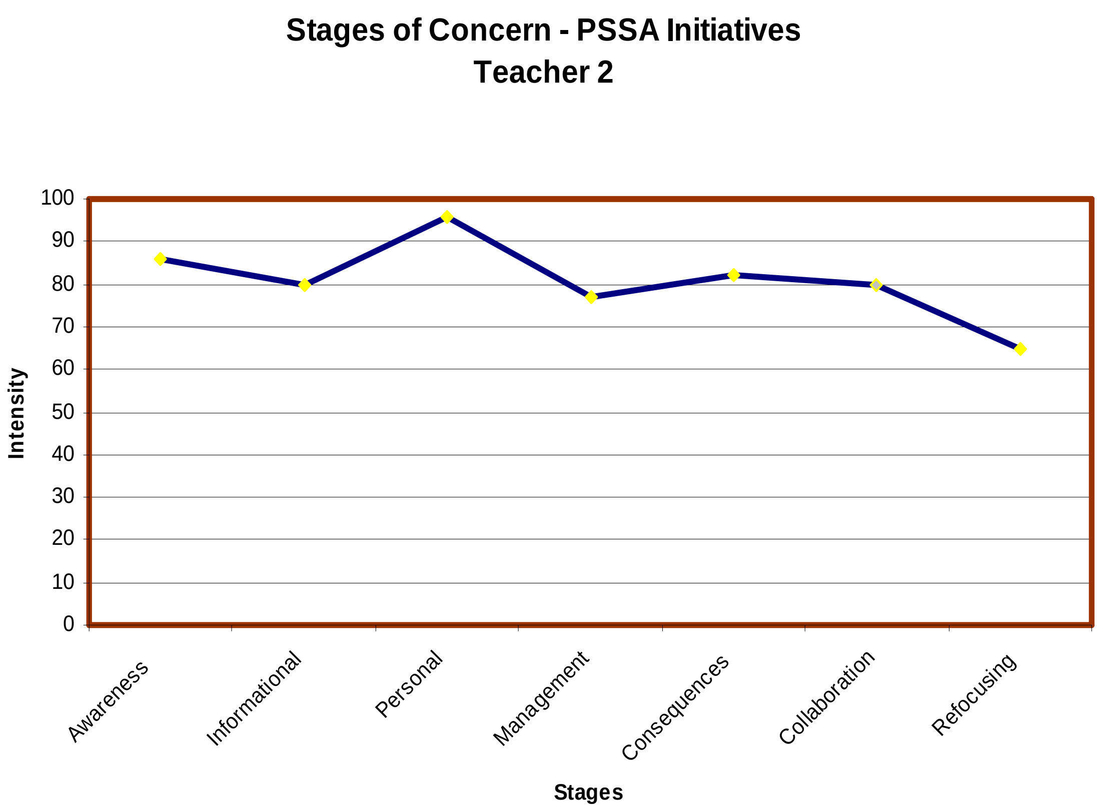
Teacher's Stages of Concern Profile





Appendix P
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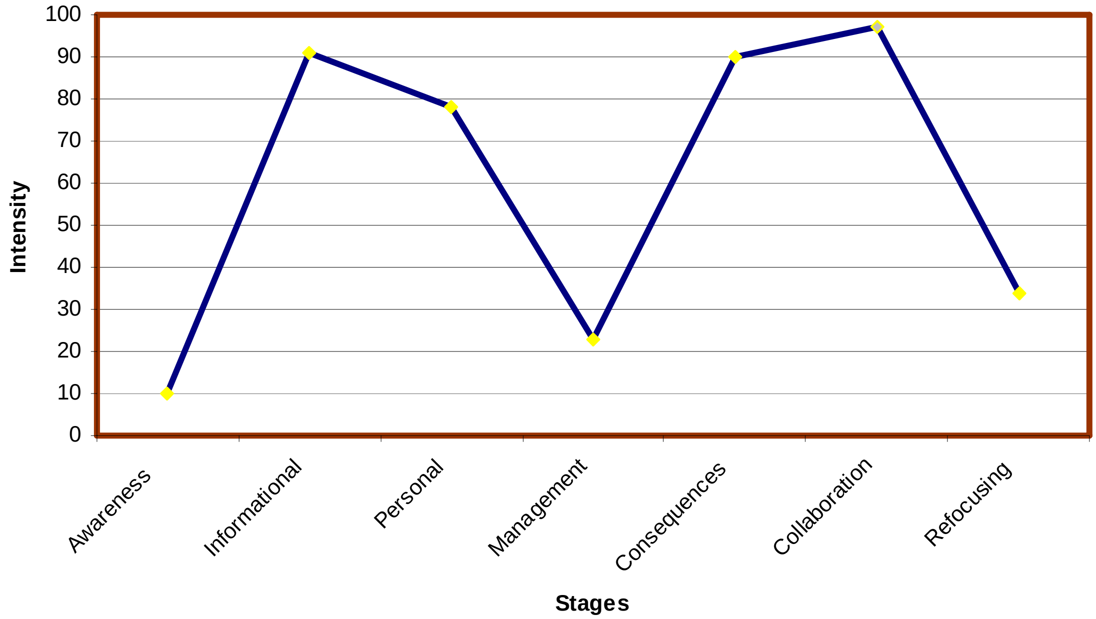
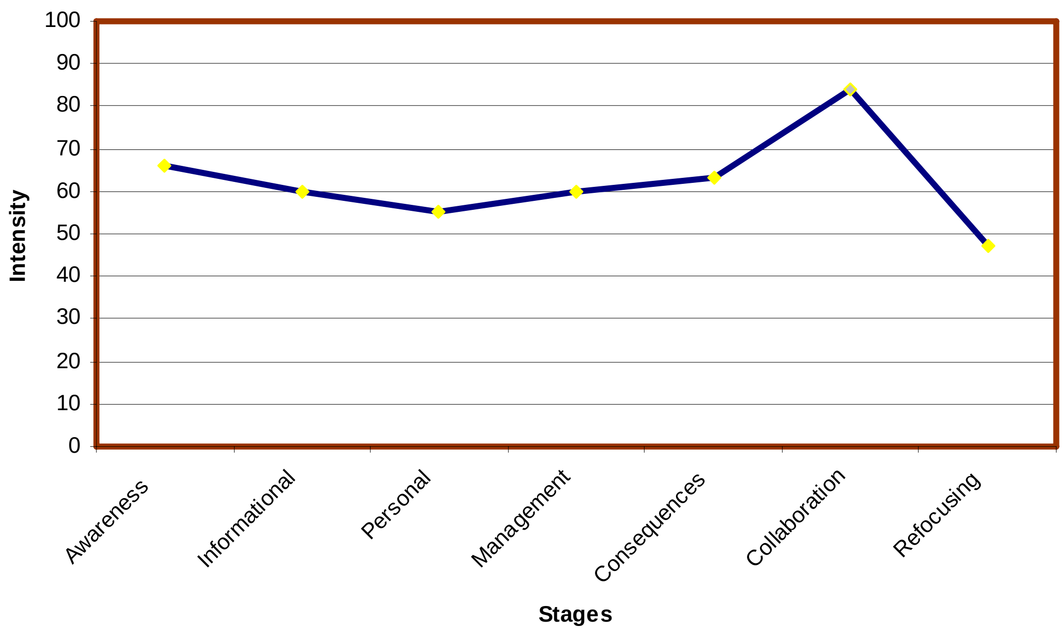
Teacher's Stages of Concern Profile

Stages of Concern - PSSA Initiatives
Teacher 3



Stages of Concern - PSSA Initiatives
Teacher 5



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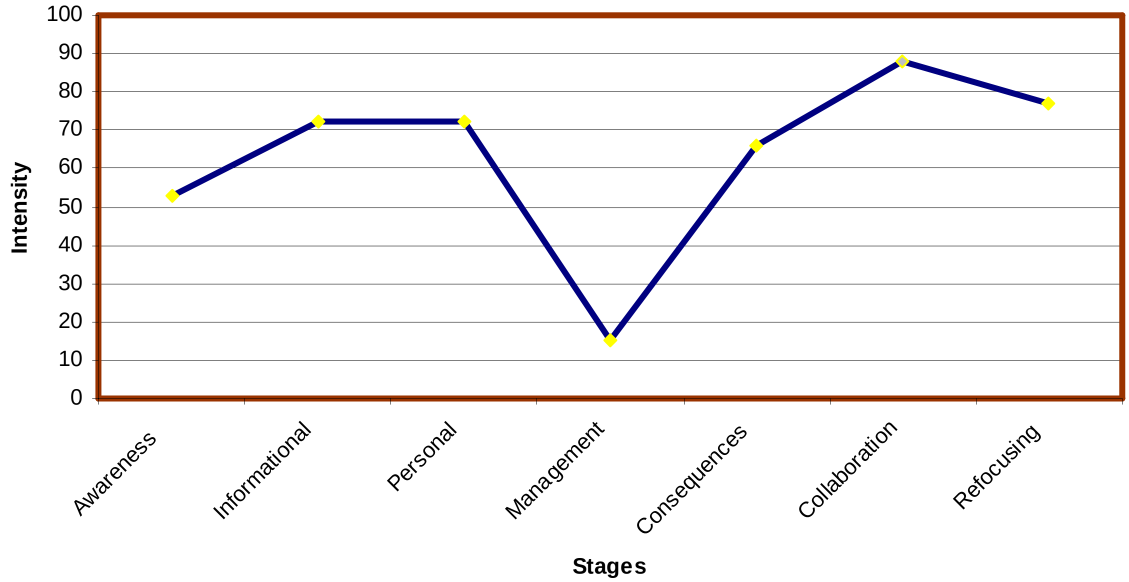
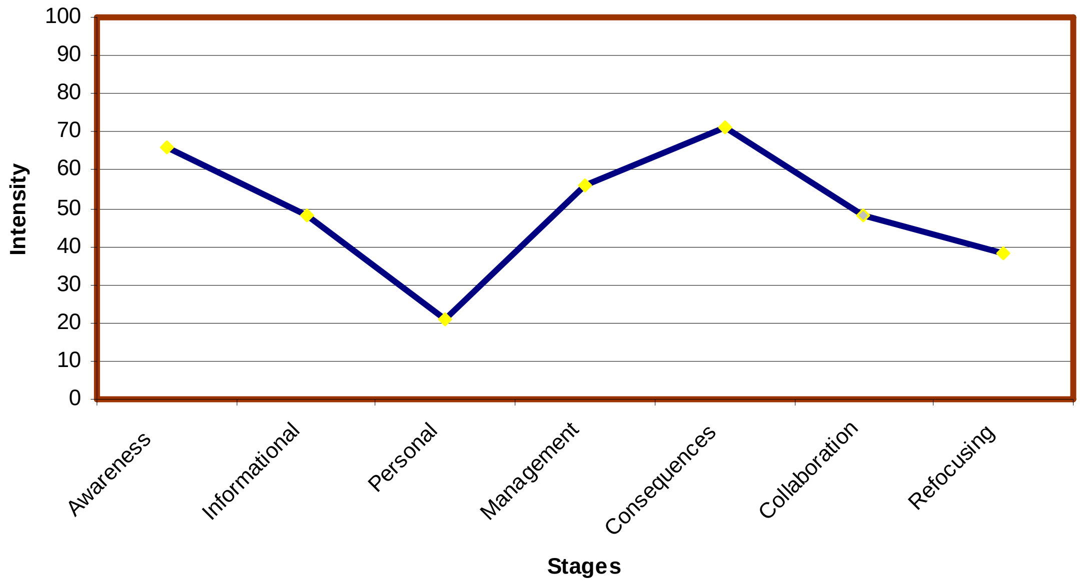
Teacher's Stages of Concern Profile

Stages of Concern - PSSA Initiatives
Teacher 6



Stages of Concern - PSSA Initiatives
Teacher 7



Appendix P
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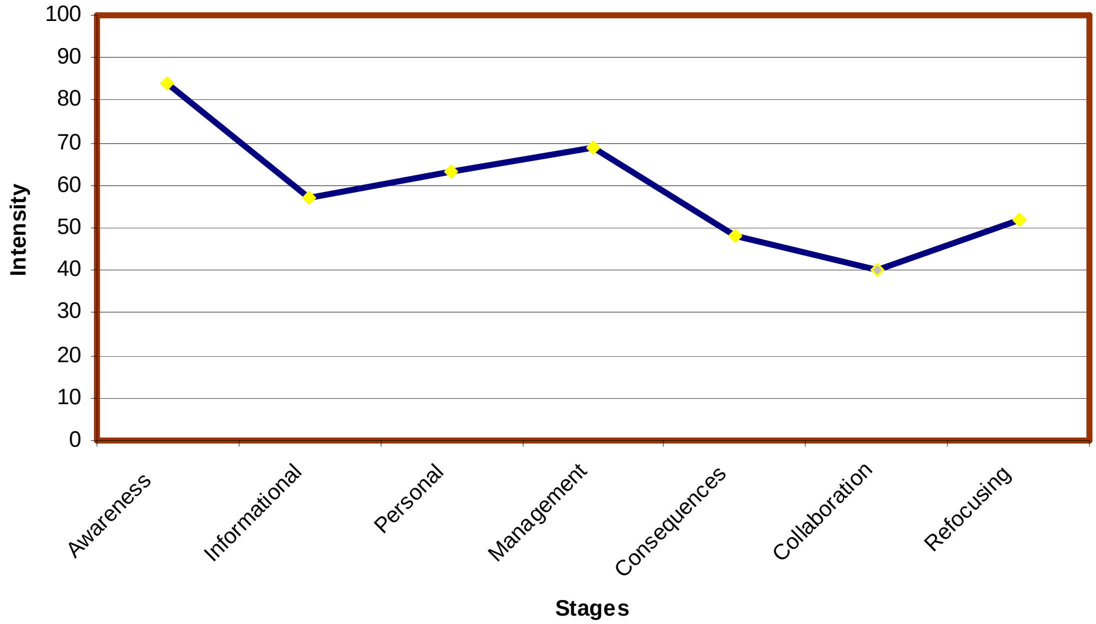
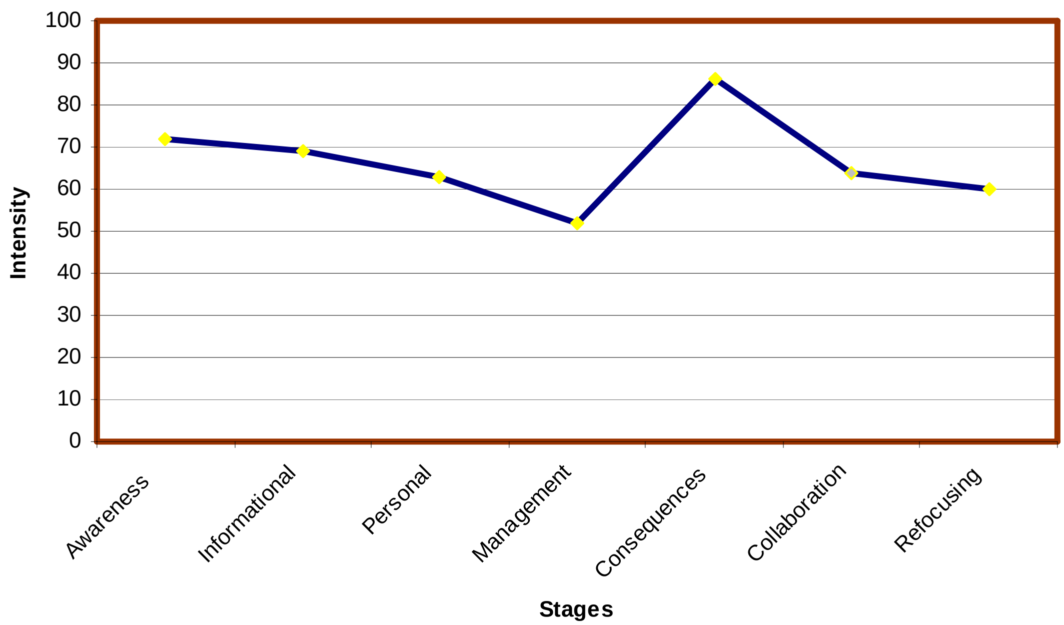
Teacher's Stages of Concern Profile

Stages of Concern - PSSA Initiatives
Teacher 8



Stages of Concern - PSSA Initiatives
Teacher 9



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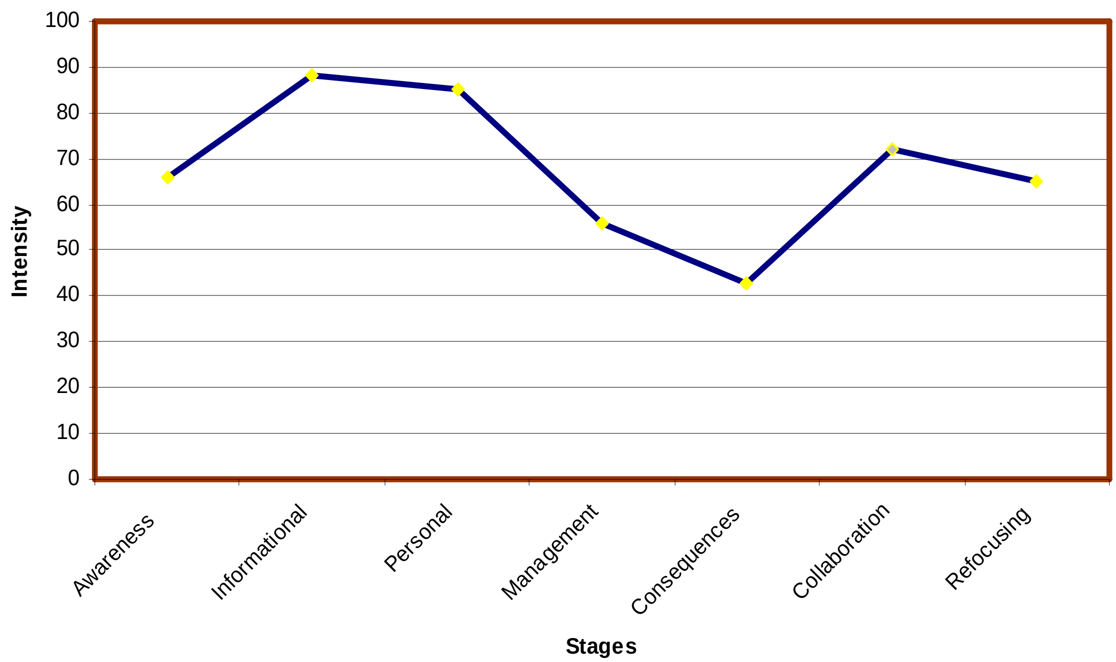
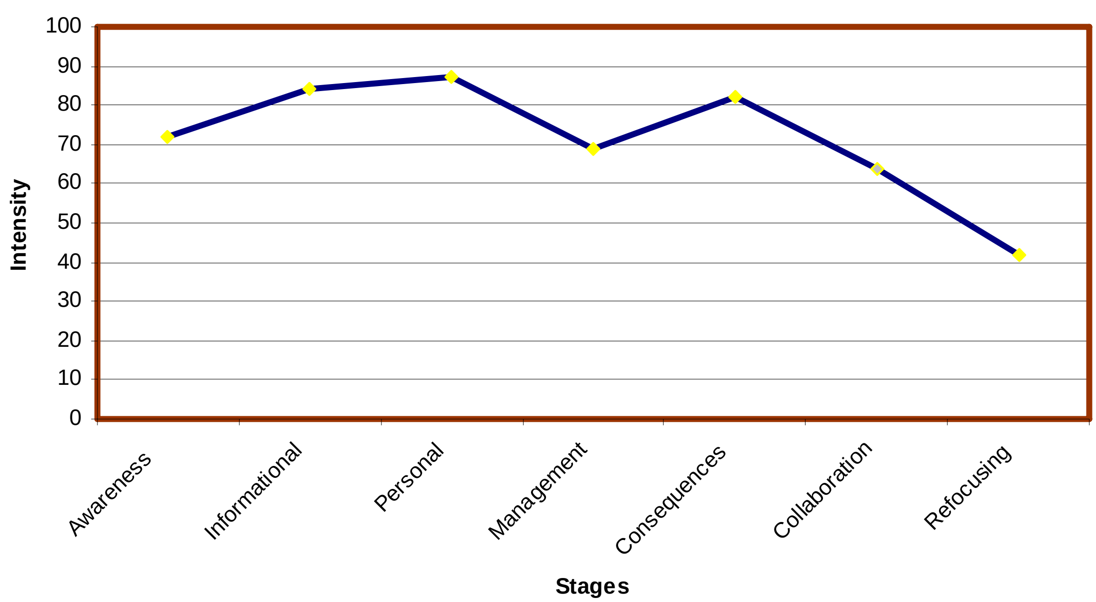
Teacher's Stages of Concern Profile

Stages of Concern - PSSA Initiatives
Teacher 10



Stages of Concern - PSSA Initiatives
Teacher 12



Appendix P
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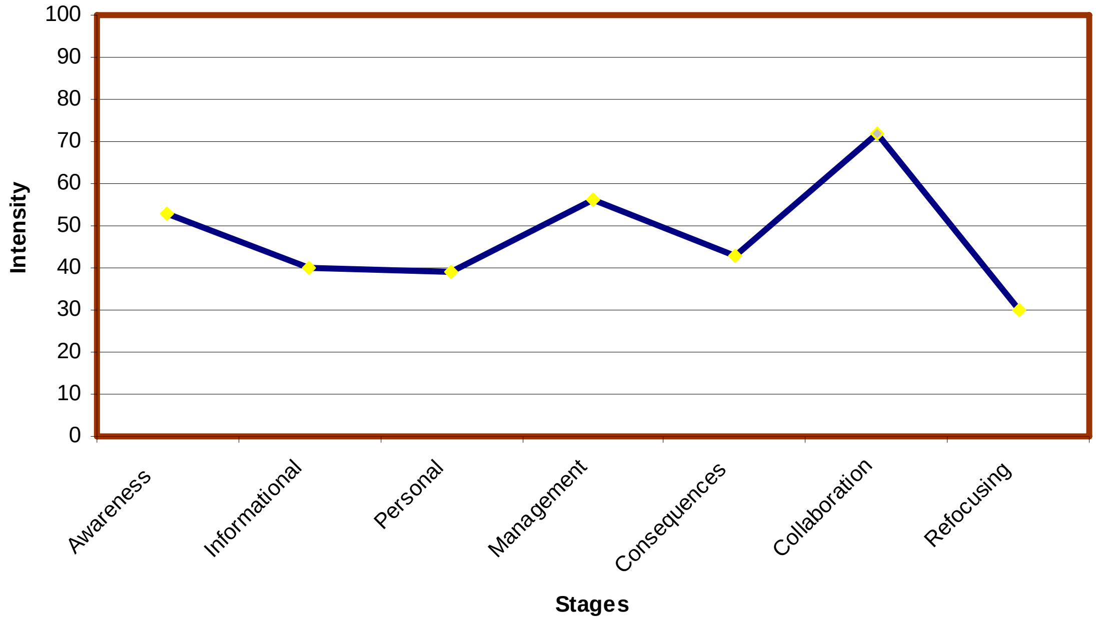
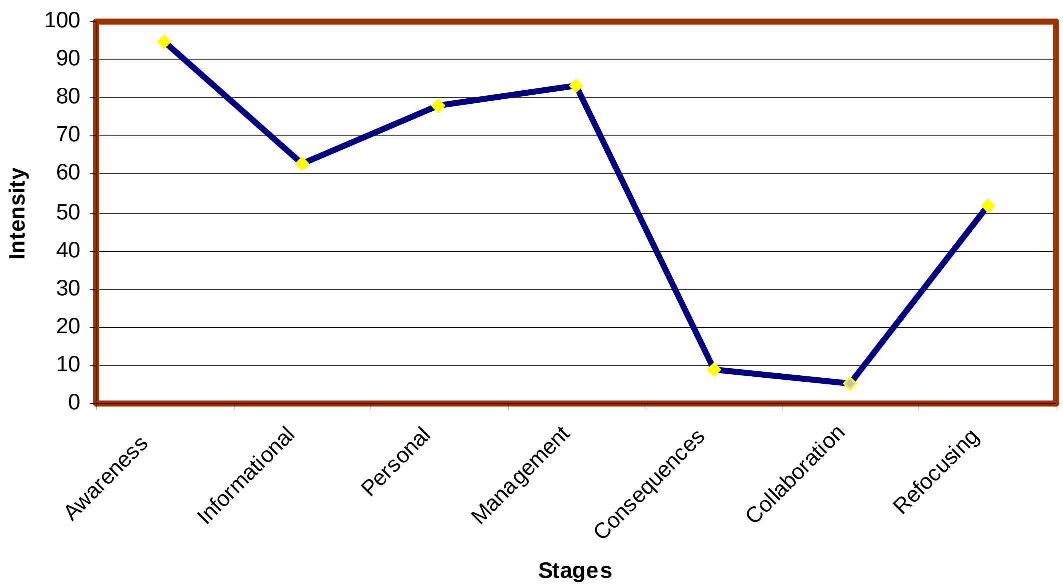
Teacher's Stages of Concern Profile

Stages of Concern - PSSA Initiatives
Teacher 13



Stages of Concern - PSSA Initiatives
Teacher 14



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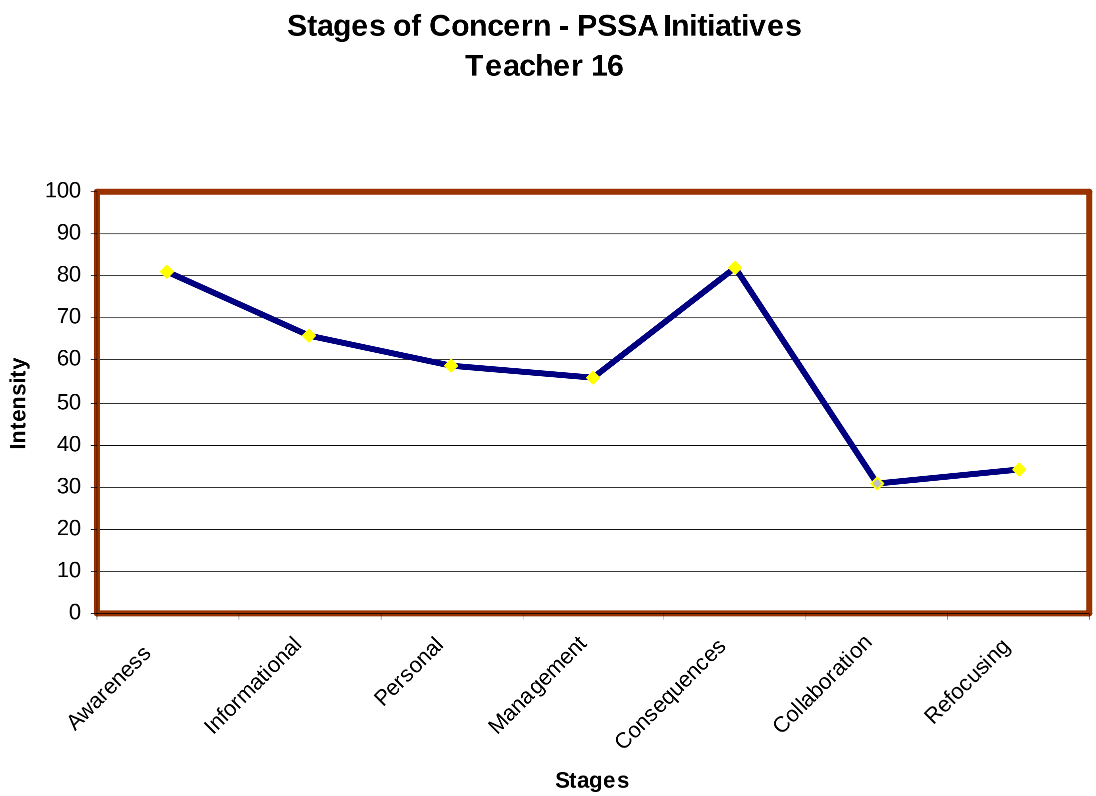
Teacher's Stages of Concern Profile



Appendix Q

SCHOOL PSSA COMPOSITE PROFILES - Math 2004

SCHOOL A 2004

OVERALL

Scaled Score 1450

Advanced	68	38%	
Proficient	76	43%	81%
Basic	15	8%	
Below Basic	19	11%	19%
Total	178		

ACCELERATED

Scaled Score 1621

Advanced	36	80%
Proficient	9	20%
Basic	0	0%
Below Basic	0	0%
Total	45	

NON-ACCELERATED

Scaled Score 1448

Advanced	33	33%	
Proficient	57	56%	89%
Basic	8	8%	
Below Basic	3	3%	11%
Total	101		

IEP

Scaled Score 1200

Advanced	1	3%	
Proficient	8	25%	28%
Basic	7	22%	
Below Basic	16	50%	72%
Total	32		

SCHOOL B 2004

OVERALL

Scaled Score 1430

Advanced	95	34%	
Proficient	102	37%	71%
Basic	48	17%	
Below Basic	32	12%	29%
Total	277		

ACCELERATED

Scaled Score 1629

Advanced	60	81%
Proficient	14	19%
Basic	0	0%
Below Basic	0	0%
Total	74	

NON-ACCELERATED

Scaled Score 1403

Advanced	34	23%	
Proficient	79	53%	76%
Basic	29	19%	
Below Basic	7	5%	24%
Total	149		

IEP

Scaled Score 1200

Advanced	1	2%	
Proficient	9	17%	19%
Basic	19	35%	
Below Basic	25	46%	81%
Total	54		

SCHOOL C 2004

OVERALL

Scaled Score 1430

Advanced	60	35%	
Proficient	63	37%	72%
Basic	31	18%	
Below Basic	16	9%	27%
Total	170		

ACCELERATED

Scaled Score 1638

Advanced	39	91%
Proficient	4	9%
Basic	0	0%
Below Basic	0	0%
Total	43	

NON-ACCELERATED

Scaled Score 1392

Advanced	20	20%	
Proficient	54	53%	73%
Basic	22	20%	
Below Basic	6	7%	27%
Total	102		

IEP

Scaled Score 1215

Advanced	1	4%	
Proficient	5	20%	24%
Basic	9	36%	
Below Basic	10	40%	76%
Total	25		

SCHOOL D 2004

OVERALL

Scaled Score 1360

Advanced	36	22%	
Proficient	61	38%	60%
Basic	35	22%	
Below Basic	29	18%	40%
Total	161		

ACCELERATED

Scaled Score 1586

Advanced	15	79%
Proficient	4	21%
Basic	0	0%
Below Basic	0	0%
Total	19	

NON-ACCELERATED

Scaled Score 1383

Advanced	21	19%	
Proficient	54	49%	68%
Basic	30	27%	
Below Basic	6	5%	32%
Total	111		

IEP

Scaled Score 1157

Advanced	0	0%	
Proficient	3	10%	10%
Basic	5	16%	
Below Basic	23	74%	90%
Total	31		

Appendix Q - Continued

SCHOOL A

TEACHER/TEAM PSSA COMPOSITE PROFILES - Math 2004

TEACHER 1

OVERALL

Scaled Score 1520

Advanced	43	54%	
Proficient	28	35%	89%
Basic	6	8%	
Below Basic	3	4%	12%
Total	80		

ACCELERATED

Scaled Score 1624

Advanced	36	80%	
Proficient	9	20%	
Basic	0	0%	
Below Basic	0	0%	
Total	45		

NON-ACCELERATED

Scaled Score 1405

Advanced	8	28%	
Proficient	13	46%	75%
Basic	5	18%	
Below Basic	2	7%	25%
Total	28		

IEP

Scaled Score 1312

Advanced	0	0%	
Proficient	5	72%	
Basic	1	14%	
Below Basic	1	14%	
Total	7		

TEACHER 2

OVERALL

Scaled Score 1453

Advanced	17	31%	
Proficient	35	64%	94%
Basic	2	4%	
Below Basic	1	2%	6%
Total	55		

ACCELERATED

Scaled Score N/A

Advanced	0	0%	
Proficient	0	0%	
Basic	0	0%	
Below Basic	0	0%	
Total	0		

NON-ACCELERATED

Scaled Score 1453

Advanced	17	31%	
Proficient	35	64%	94%
Basic	2	4%	
Below Basic	1	2%	6%
Total	55		

IEP

Scaled Score N/A

Advanced	0	0%	
Proficient	0	0%	
Basic	0	0%	
Below Basic	0	0%	
Total	0		

TEACHER 3

OVERALL

Scaled Score 1368

Advanced	2	13%	
Proficient	9	60%	73%
Basic	3	20%	
Below Basic	1	7%	27%
Total	15		

ACCELERATED

Scaled Score N/A

Advanced	0	0%	
Proficient	0	0%	
Basic	0	0%	
Below Basic	0	0%	
Total	0		

NON-ACCELERATED

Scaled Score 1389

Advanced	1	10%	
Proficient	7	70%	80%
Basic	1	10%	
Below Basic	1	10%	20%
Total	10		

IEP

Scaled Score 1325

Advanced	1	20%	
Proficient	1	20%	40%
Basic	2	40%	
Below Basic	1	20%	60%
Total	5		

TEACHER 4

OVERALL

Scaled Score 1130

Advanced	0	0%	
Proficient	2	10%	10%
Basic	4	20%	
Below Basic	14	70%	90%
Total	20		

ACCELERATED

Scaled Score N/A

Advanced	0	0%	
Proficient	0	0%	
Basic	0	0%	
Below Basic	0	0%	
Total	0		

NON-ACCELERATED

Scaled Score N/A

Advanced	0	0%	
Proficient	0	0%	
Basic	0	0%	
Below Basic	0	0%	
Total	0		

IEP

Scaled Score 1130

Advanced	0	0%	
Proficient	2	10%	10%
Basic	4	20%	
Below Basic	14	70%	90%
Total	20		

Appendix Q - Continued

SCHOOL B **TEACHER/TEAM PSSA COMPOSITE PROFILES - Math 2004**

TEACHER 5

OVERALL

Scaled Score 1477

Advanced	36	41%	
Proficient	34	39%	80%
Basic	16	18%	
Below Basic	2	2%	20%

Total 88

ACCELERATE

Scaled Score 1658

Advanced	21	88%
Proficient	3	12%
Basic	0	0%
Below Basic	0	0%

Total 24

NON-ACCELE

Scaled Score 1428

Advanced	14	26%	
Proficient	29	55%	81%
Basic	9	17%	
Below Basic	1	2%	19%

Total 53

IEP

Scaled Score 1316

Advanced	1	9%	
Proficient	2	18%	27%
Basic	7	64%	
Below Basic	1	9%	73%

Total 11

TEACHER 6

OVERALL

Scaled Score 1458

Advanced	31	36%	
Proficient	40	46%	82%
Basic	14	16%	
Below Basic	2	2%	18%

Total 87

ACCELERATED

Scaled Score 1637

Advanced	22	81%
Proficient	5	19%
Basic	0	0%
Below Basic	0	0%

Total 27

NON-ACCELERATED

Scaled Score 1386

Advanced	9	16%	
Proficient	32	58%	74%
Basic	13	24%	
Below Basic	1	2%	26%

Total 55

IEP

Scaled Score 1282

Advanced	0		
Proficient	3	60%	60%
Basic	1	20%	
Below Basic	1	20%	40%

Total 5

TEACHER 7

OVERALL

Scaled Score 1478

Advanced	19	41%	
Proficient	20	43%	85%
Basic	6	13%	
Below Basic	1	2%	15%

Total 46

ACCELERATED

Scaled Score 1591

Advanced	17	73%
Proficient	6	26%
Basic	0	0%
Below Basic	0	0%

Total 23

NON-ACCELERATED

Scaled Score 1366

Advanced	2	9%	
Proficient	14	61%	70%
Basic	6	26%	
Below Basic	1	4%	30%

Total 23

IEP

Scaled Score N/A

Advanced	0	0%
Proficient	0	0%
Basic	0	0%
Below Basic	0	0%

Total 0

TEACHER 8

OVERALL

Scaled Score 1156

Advanced	0	0%	
Proficient	4	11%	11%
Basic	11	29%	
Below Basic	23	61%	89%

Total 38

ACCELERATED

Scaled Score N/A

Advanced	0	0%
Proficient	0	0%
Basic	0	0%
Below Basic	0	0%

Total 0

NON-ACCELERATED

Scaled Score N/A

Advanced	0	0%
Proficient	0	0%
Basic	0	0%
Below Basic	0	0%

Total

IEP

Scaled Score 1156

Advanced	0	0%	
Proficient	4	11%	11%
Basic	11	29%	
Below Basic	23	61%	89%

Total 38

SCHOOL C

TEACHER/TEAM PSSA COMPOSITE PROFILES - Math 2004

TEACHER 9

OVERALL

Scaled Score 1398

Advanced	22	27%	
Proficient	35	43%	70%
Basic	14	17%	
Below Basic	10	13%	30%
Total	81		

ACCELERATED

Scaled Score 1650

Advanced	15	94%
Proficient	1	6%
Basic	0	0%
Below Basic	0	0%
Total	16	

NON-ACCELERATED

Scaled Score 1358

Advanced	7	13%	
Proficient	30	57%	70%
Basic	10	19%	
Below Basic	6	11%	30%
Total	53		

IEP

Scaled Score 1239

Advanced	0	0%	
Proficient	4	33%	33%
Basic	4	33%	
Below Basic	4	33%	67%
Total	12		

TEACHER 10

OVERALL

Scaled Score 1503

Advanced	38	53%	
Proficient	23	32%	85%
Basic	10	14%	
Below Basic	1	1%	15%
Total	72		

ACCELERATED

Scaled Score 1632

Advanced	24	89%
Proficient	3	11%
Basic	0	0%
Below Basic	0	0%
Total	27	

NON-ACCELERATED

Scaled Score 1394

Advanced	7	18%	
Proficient	21	54%	72%
Basic	10	26%	
Below Basic	1	3%	29%
Total	39		

IEP

Scaled Score N/A

Advanced	0	0%
Proficient	0	0%
Basic	0	0%
Below Basic	0	0%
Total	0	

TEACHER 11

OVERALL

Scaled Score 1193

Advanced	1	8%	
Proficient	1	8%	16%
Basic	5	38%	
Below Basic	6	46%	84%
Total	13		

ACCELERATED

Scaled Score N/A

Advanced	0	0%
Proficient	0	0%
Basic	0	0%
Below Basic	0	0%
Total		

NON-ACCELERATED

Scaled Score N/A

Advanced	0	0%
Proficient	0	0%
Basic	0	0%
Below Basic	0	0%
Total		

IEP

Scaled Score 1193

Advanced	1	8%	
Proficient	1	8%	16%
Basic	5	38%	
Below Basic	6	46%	84%
Total	13		

TEACHER 12

OVERALL

Scaled Score

Advanced		
Proficient		
Basic		
Below Basic		
Total		

ACCELERATED

Scaled Score

Advanced		
Proficient		
Basic		
Below Basic		
Total		

NON-ACCELERATED

Scaled Score

Advanced		
Proficient		
Basic		
Below Basic		
Total		

IEP

Scaled Score

Advanced		
Proficient		
Basic		
Below Basic		
Total		

Appendix Q - Continued

SCHOOL D **TEACHER/TEAM PSSA COMPOSITE PROFILES - Math 2004**

TEACHER 13

OVERALL

Scaled Score 1417

Advanced	24	37%	
Proficient	21	32%	69%
Basic	11	17%	
Below Basic	9	14%	31%
Total	65		

ACCELERATED

Scaled Score 1585

Advanced	15	79%
Proficient	4	21%
Basic	0	0%
Below Basic	0	0%
Total	19	

NON-ACCELERATED

Scaled Score 1359

Advanced	9	22%	
Proficient	15	37%	59%
Basic	10	24%	
Below Basic	7	17%	41%
Total	41		

IEP

Scaled Score 1252

Advanced	0	0%
Proficient	2	40%
Basic	1	20%
Below Basic	2	40%
Total	5	

TEACHER 14

OVERALL

Scaled Score 1377

Advanced	5	11%	
Proficient	28	62%	73%
Basic	11	24%	
Below Basic	1	2%	26%
Total	45		

ACCELERATED

Scaled Score N/A

Advanced	0	0%
Proficient	0	0%
Basic	0	0%
Below Basic	0	0%
Total	0	

NON-ACCELERATED

Scaled Score 1378

Advanced	5	11%	
Proficient	27	61%	72%
Basic	11	25%	
Below Basic	1	2%	27%
Total	44		

IEP

Scaled Score N/A

Advanced	0	0%
Proficient	1	100%
Basic	0	0%
Below Basic	0	0%
Total	1	

TEACHER 15

OVERALL

Scaled Score 1384

Advanced	4	19%	
Proficient	10	48%	67%
Basic	6	29%	
Below Basic	1	5%	34%
Total	21		

ACCELERATED

Scaled Score N/A

Advanced	0	0%
Proficient	0	0%
Basic	0	0%
Below Basic	0	0%
Total	0	

NON-ACCELERATED

Scaled Score 1406

Advanced	4	21%	
Proficient	10	53%	74%
Basic	5	26%	
Below Basic	0	0%	26%
Total	19		

IEP

Scaled Score 1169

Advanced	0	0%
Proficient	0	0%
Basic	1	50%
Below Basic	1	50%
Total	2	

TEACHER 16

OVERALL

Scaled Score 1130

Advanced	0	0%	
Proficient	0	0%	0%
Basic	3	13%	
Below Basic	20	87%	100%
Total	23		.

ACCELERATED

Scaled Score

Advanced	0	0%
Proficient	0	0%
Basic	0	0%
Below Basic	0	0%
Total		

NON-ACCELERATED

Scaled Score N/A

Advanced	0	0%
Proficient	0	0%
Basic	0	0%
Below Basic	0	0%
Total	0	

IEP

Scaled Score 1130

Advanced	0	0%	
Proficient	0	0%	0%
Basic	3	13%	
Below Basic	20	87%	100%
Total	23		.

Appendix R

SCHOOL PSSA COMPOSITE PROFILES - Math 2005

SCHOOL A 2005

OVERALL

Scaled Score 1472

Advanced	112	58%	
Proficient	53	28%	86%
Basic	12	6%	
Below Basic	15	8%	14%
Total	192		

ACCELERATED

Scaled Score 1623

Advanced	53	88%
Proficient	7	12%
Basic	0	0%
Below Basic	0	0%
Total	60	

NON-ACCELERATED

Scaled Score 1476

Advanced	58	57%	
Proficient	36	36%	93%
Basic	6	6%	
Below Basic	1	1%	7%
Total	101		

IEP

Scaled Score 1221

Advanced	1	3%	
Proficient	10	32%	35%
Basic	6	19%	
Below Basic	14	45%	65%
Total	31		

SCHOOL B 2005

OVERALL

Scaled Score 1455

Advanced	164	58%	
Proficient	80	27%	83%
Basic	31	11%	
Below Basic	19	6%	17%
Total	294		

ACCELERATED

Scaled Score 1628

Advanced	88	94%
Proficient	6	6%
Basic	0	0%
Below Basic	0	0%
Total	94	

NON-ACCELERATED

Scaled Score 1406

Advanced	70	45%	
Proficient	57	37%	82%
Basic	20	13%	
Below Basic	8	5%	18%
Total	155		

IEP

Scaled Score 1272

Advanced	6	13%	
Proficient	17	38%	49%
Basic	11	24%	
Below Basic	11	24%	51%
Total	45		

SCHOOL C 2005

OVERALL

Scaled Score 1481

Advanced	121	66%	
Proficient	34	18%	84%
Basic	16	9%	
Below Basic	13	7%	16%
Total	184		

ACCELERATED

Scaled Score 1676

Advanced	51	98%
Proficient	1	2%
Basic	0	0%
Below Basic	0	0%
Total	52	

NON-ACCELERATED

Scaled Score 1470

Advanced	62	67%	
Proficient	27	29%	97%
Basic	2	2%	
Below Basic	1	1%	3%
Total	92		

IEP

Scaled Score 1254

Advanced	8	20%	
Proficient	7	18%	38%
Basic	13	33%	
Below Basic	12	30%	62%
Total	40		

SCHOOL D 2005

OVERALL

Scaled Score 1452

Advanced	92	52%	
Proficient	48	27%	80%
Basic	23	13%	
Below Basic	13	7%	20%
Total	176		

ACCELERATED

Scaled Score 1700

Advanced	36	100%
Proficient	0	0%
Basic	0	0%
Below Basic	0	0%
Total	36	

NON-ACCELERATED

Scaled Score 1435

Advanced	54	51%	
Proficient	36	34%	85%
Basic	13	12%	
Below Basic	2	2%	15%
Total	105		

IEP

Scaled Score 1246

Advanced	2	6%	
Proficient	10	29%	35%
Basic	13	38%	
Below Basic	9	26%	65%
Total	34		

Appendix R -Continued

SCHOOL A **TEACHER/TEAM PSSA COMPOSITE PROFILES - Math 2005**

TEACHER 1

OVERALL

Scaled Score 1522

Advanced	67	69%	
Proficient	27	29%	97%
Basic	3	3%	
Below Basic	0	0%	3%
Total	97		

ACCELERATED

Scaled Score 1601

Advanced	33	87%
Proficient	5	13%
Basic	0	0%
Below Basic	0	0%
Total	38	

NON-ACCELERATED

Scaled Score 1474

Advanced	34	60%	
Proficient	20	35%	95%
Basic	3	5%	
Below Basic	0	0%	5%
Total	57		

IEP

Scaled Score NA

Advanced	0	
Proficient	2	100%
Basic	0	
Below Basic	0	
Total	2	

TEACHER 2

OVERALL

Scaled Score 1563

Advanced	39	78%	
Proficient	11	22%	####
Basic	0	0%	
Below Basic	0	0%	
Total	50		

ACCELERATED

Scaled Score 1661

Advanced	20	91%	
Proficient	2	9%	####
Basic	0	0%	
Below Basic	0	0%	
Total	22		

NON-ACCELERATED

Scaled Score 1487

Advanced	18	69%	
Proficient	8	31%	####
Basic	0	0%	
Below Basic	0	0%	
Total	26		

IEP

Scaled Score NA

Advanced	1	50%
Proficient	1	50%
Basic	0	0%
Below Basic	0	0%
Total	2	

TEACHER 3

OVERALL

Scaled Score 1359

Advanced	6	24%	
Proficient	13	52%	76%
Basic	4	16%	
Below Basic	2	8%	24%
Total	25		

ACCELERATED

Scaled Score NA

Advanced	0	0%
Proficient	0	0%
Basic	0	0%
Below Basic	0	0%
Total	0	

NON-ACCELERATED

Scaled Score 1382

Advanced	6	33%	
Proficient	8	44%	77%
Basic	3	17%	
Below Basic	1	6%	23%
Total	18		

IEP

Scaled Score 1300

Advanced	0	0%	
Proficient	5	71%	71%
Basic	1	14%	
Below Basic	1	14%	29%
Total	7		

TEACHER 4

OVERALL

Scaled Score 1149

Advanced	0	0%	
Proficient	2	10%	10%
Basic	5	25%	
Below Basic	13	65%	90%
Total	20		

ACCELERATED

Scaled Score NA

Advanced	0	0%
Proficient	0	0%
Basic	0	0%
Below Basic	0	0%
Total	0	

NON-ACCELERATED

Scaled Score N/A

Advanced	0	0%
Proficient	0	0%
Basic	0	0%
Below Basic	0	0%
Total	0	

IEP

Scaled Score 1149

Advanced	0	0%	
Proficient	2	10%	10%
Basic	5	25%	
Below Basic	13	65%	90%
Total	20		

SCHOOL B **TEACHER/TEAM PSSA COMPOSITE PROFILES - Math 2005**

TEACHER 5

OVERALL

Scaled Score 1490

Advanced	65	60%	
Proficient	34	31%	91%
Basic	6	6%	
Below Basic	3	3%	9%
Total	108		

ACCELERATED

Scaled Score 1641

Advanced	30	94%
Proficient	2	6%
Basic	0	0%
Below Basic	0	0%
Total	32	

NON-ACCELERATED

Scaled Score 1446

Advanced	31	50%	
Proficient	27	44%	94%
Basic	3	5%	
Below Basic	1	2%	6%
Total	62		

IEP

Scaled Score 1345

Advanced	4	29%	
Proficient	5	36%	64%
Basic	3	21%	
Below Basic	2	14%	36%
Total	14		

TEACHER 6

OVERALL

Scaled Score 1475

Advanced	65	65%	
Proficient	22	22%	87%
Basic	8	8%	
Below Basic	5	5%	13%
Total	100		

ACCELERATED

Scaled Score 1603

Advanced	31	89%
Proficient	4	11%
Basic	0	0%
Below Basic	0	0%
Total	35	

NON-ACCELERATED

Scaled Score 1400

Advanced	32	52%	
Proficient	18	29%	81%
Basic	7	11%	
Below Basic	5	8%	19%
Total	62		

IEP

Scaled Score NA

Advanced	2	66%	
Proficient	0	0%	67%
Basic	1	33%	
Below Basic	0	0%	33%
Total	3		

TEACHER 7

OVERALL

Scaled Score 1480

Advanced	34	59%	
Proficient	12	21%	80%
Basic	10	17%	
Below Basic	2	3%	20%
Total	58		

ACCELERATED

Scaled Score 1643

Advanced	27	100%
Proficient	0	
Basic	0	
Below Basic	0	
Total	27	

NON-ACCELERATED

Scaled Score 1332

Advanced	7	23%	
Proficient	12	39%	62%
Basic	10	32%	
Below Basic	2	6%	38%
Total	31		

IEP

Scaled Score N/A

Advanced	0	0%
Proficient	0	0%
Basic	0	0%
Below Basic	0	0%
Total	0	

TEACHER 8

OVERALL

Scaled Score 1237

Advanced	0	0%	
Proficient	12	43%	43%
Basic	7	25%	
Below Basic	9	32%	57%
Total	28		

ACCELERATED

Scaled Score N/A

Advanced	0	0%
Proficient	0	0%
Basic	0	0%
Below Basic	0	0%
Total	0	

NON-ACCELERATED

Scaled Score N/A

Advanced	0	0%
Proficient	0	0%
Basic	0	0%
Below Basic	0	0%
Total		

IEP

Scaled Score 1237

Advanced	0	0%	
Proficient	12	43%	43%
Basic	7	25%	
Below Basic	9	32%	57%
Total	28		

Appendix R -Continued

SCHOOL C — TEACHER/TEAM PSSA COMPOSITE PROFILES - Math 2005

TEACHER 9

OVERALL

Scaled Score 1556

Advanced	81	80%	
Proficient	15	15%	95%
Basic	4	4%	
Below Basic	1	1%	5%
Total	101		

ACCELERATED

Scaled Score 1674

Advanced	51	98%
Proficient	1	2%
Basic	0	0%
Below Basic	0	0%
Total	52	

NON-ACCELERATED

Scaled Score 1477

Advanced	27	68%	
Proficient	12	30%	97%
Basic	0	0%	
Below Basic	1	3%	3%
Total	40		

IEP

Scaled Score 1387

Advanced	3	33%	
Proficient	3	33%	68%
Basic	3	33%	
Below Basic	0	0%	33%
Total	9		

TEACHER 10

OVERALL

Scaled Score 1481

Advanced	40	66%	
Proficient	18	30%	95%
Basic	3	5%	
Below Basic	0	0%	5%
Total	61		

ACCELERATED

Scaled Score NA

Advanced	0	0%
Proficient	0	0%
Basic	0	0%
Below Basic	0	0%
Total	0	

NON-ACCELERATED

Scaled Score 1491

Advanced	35	67%	
Proficient	15	29%	96%
Basic	2	4%	
Below Basic	0	0%	4%
Total	52		

IEP

Scaled Score 1421

Advanced	5	56%	
Proficient	3	33%	89%
Basic	1	11%	
Below Basic	0	0%	11%
Total	9		

TEACHER 11

OVERALL NA

Scaled Score

Advanced	0	0%
Proficient	0	0%
Basic	0	0%
Below Basic	0	0
Total		

ACCELERATED

Scaled Score NA

Advanced	0	0%
Proficient	0	0%
Basic	0	0%
Below Basic	0	0%
Total	0	

NON-ACCELERATED

Scaled Score NA

Advanced	0	0%
Proficient	0	0%
Basic	0	0%
Below Basic	0	0%
Total	0	

IEP

Scaled Score NA

Advanced	0	0%
Proficient	0	0%
Basic	0	0%
Below Basic	0	0%
Total	0	

TEACHER 12

OVERALL

Scaled Score 1131

Advanced	0	0%	
Proficient	1	5%	5%
Basic	9	41%	
Below Basic	12	55%	95%
Total	22		

ACCELERATED

Scaled Score N/A

Advanced	0	0%
Proficient	0	0%
Basic	0	0%
Below Basic	0	0%
Total		

NON-ACCELERATED

Scaled Score N/A

Advanced	0	0%
Proficient	0	0%
Basic	0	0%
Below Basic	0	0%
Total		

IEP

Scaled Score 1131

Advanced	0	0%	
Proficient	1	5%	5%
Basic	9	41%	
Below Basic	12	55%	95%
Total	22		

Appendix R -Continued

SCHOOL D **TEACHER/TEAM PSSA COMPOSITE PROFILES - Math 2005**

TEACHER 13

OVERALL

Scaled Score 1583

Advanced	48	81%	
Proficient	6	10%	91%
Basic	3	5%	
Below Basic	2	3%	9%
Total	59		

ACCELERATED

Scaled Score 1700

Advanced	36	100%
Proficient	0	
Basic	0	
Below Basic	0	
Total	36	

NON-ACCELERATED

Scaled Score 1442

Advanced	10	63%	
Proficient	2	25%	87%
Basic	3	0%	
Below Basic	0	13%	13%
Total	15		

IEP

Scaled Score 1359

Advanced	2	29%	
Proficient	2	29%	57%
Basic	3	43%	
Below Basic	0	0%	43%
Total	7		

TEACHER 14

OVERALL

Scaled Score 1423

Advanced	36	46%	
Proficient	31	40%	86%
Basic	9	12%	
Below Basic	2	3%	14%
Total	78		

ACCELERATED

Scaled Score NA

Advanced	0	0%
Proficient	0	0%
Basic	0	0%
Below Basic	0	0%
Total	0	

NON-ACCELERATED

Scaled Score 1432

Advanced	36	49%	
Proficient	28	38%	87%
Basic	8	11%	
Below Basic	2	3%	13%
Total	74		

IEP

Scaled Score NA

Advanced	0	0%	
Proficient	3	75%	75%
Basic	1	25%	
Below Basic	0	0%	25%
Total	4		

TEACHER 15

OVERALL

Scaled Score 1444

Advanced	8	50%	
Proficient	6	38%	88%
Basic	2	12%	
Below Basic	0	0%	12%
Total	16		

ACCELERATED

Scaled Score N/A

Advanced	0	0%
Proficient	0	0%
Basic	0	0%
Below Basic	0	0%
Total	0	

NON-ACCELERATED

Scaled Score 1444

Advanced	8	50%	
Proficient	6	38%	88%
Basic	2	12%	
Below Basic	0	0%	12%
Total	16		

IEP

Scaled Score N/A

Advanced	0	0%
Proficient	0	0%
Basic	0	0%
Below Basic	0	0%
Total	0	

TEACHER 16

OVERALL

Scaled Score 1209

Advanced	0	0%	
Proficient	5	22%	22%
Basic	9	39%	
Below Basic	9	39%	78%
Total	23		

ACCELERATED

Scaled Score

Advanced	0	0%
Proficient	0	0%
Basic	0	0%
Below Basic	0	0%
Total		

NON-ACCELERATED

Scaled Score N/A

Advanced	0	0%
Proficient	0	0%
Basic	0	0%
Below Basic	0	0%
Total	0	

IEP

Scaled Score 1209

Advanced	0	0%	
Proficient	5	22%	22%
Basic	9	39%	
Below Basic	9	39%	78%
Total	23		

Appendix S

School Level Assessment Score Comparison: 2004 -2005

School A - OVERALL RESULTS

Data Set A: 2004

- 180 data points were entered
- Mean = 1.442
- 95% confidence interval for actual Mean: 1414. thru 1470.
- Standard Deviation = 193.
- High = 1.983 Low = 969.
- Third Quartile = 1.562 First Quartile = 1.317
- Median = 1.447
- Average Absolute Deviation from Median = 153.

Data Set B: 2005

- 194 data points were entered
- Mean = 1.472
- 95% confidence interval for actual Mean: 1445. thru 1498.
- Standard Deviation = 186.
- High = 2.016 Low = 996.
- Third Quartile = 1.579 First Quartile = 1.370
- Median = 1.465
- Average Absolute Deviation from Median = 144.

Kolmogorov-Smirnov Comparison of Two Data Sets

The KS-test seeks differences between your two datasets; it is non-parametric and distribution free. Reject the null hypothesis of no difference between your datasets if *P* is "small".

The maximum difference between the cumulative distributions, *D*, is: 0.1196 with a corresponding *P* of: 0.128

Appendix S
(continued)

School Level Assessment Score Comparison: 2004 -2005

School A - OVERALL RESULTS

Data Set 1: 2004

Items in Data Set 1:

969. 996. 996. 996. 1.009 1.057 1.079 1.079 1.090 1.101 1.111 1.111 1.142 1.142 1.152 1.162 1.162 1.162 1.172 1.172 1.172 1.182 1.191 1.201 1.201 1.211 1.220 1.230 1.249 1.259 1.268 1.268 1.278 1.278 1.288 1.297 1.307 1.307 1.307 1.307 1.307 1.317 1.317 1.317 1.317 1.317 1.327 1.327 1.337 1.337 1.347 1.347 1.347 1.358 1.358 1.358 1.358 1.358 1.368 1.368 1.368 1.368 1.379 1.379 1.379 1.379 1.379 1.390 1.390 1.401 1.401 1.401 1.412 1.412 1.412 1.423 1.423 1.423 1.423 1.423 1.435 1.435 1.435 1.435 1.435 1.447 1.447 1.447 1.447 1.447 1.447 1.460 1.460 1.460 1.460 1.472 1.472 1.472 1.472 1.472 1.486 1.486 1.486 1.486 1.499 1.499 1.499 1.499 1.499 1.499 1.499 1.499 1.514 1.514 1.514 1.514 1.529 1.529 1.529 1.529 1.529 1.529 1.545 1.545 1.545 1.545 1.545 1.562 1.562 1.562 1.562 1.562 1.562 1.562 1.562 1.562 1.580 1.580 1.580 1.580 1.599 1.599 1.599 1.599 1.620 1.620 1.620 1.620 1.620 1.620 1.620 1.620 1.642 1.642 1.642 1.642 1.642 1.642 1.667 1.667 1.667 1.667 1.694 1.694 1.694 1.694 1.694 1.724 1.724 1.724 1.758 1.758 1.758 1.758 1.758 1.798 1.798 1.798 1.903 1.983

School A - OVERALL RESULTS

Data Set 2: 2005

Items in Data Set 2:

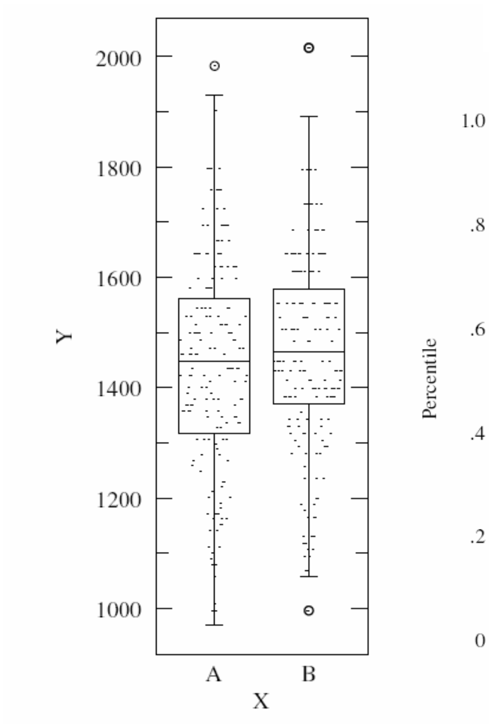
996. 996. 1.068 1.068 1.093 1.093 1.106 1.106 1.118 1.118 1.130 1.130 1.130 1.166 1.166 1.177 1.189 1.189 1.200 1.235 1.235 1.235 1.258 1.281 1.281 1.281 1.281 1.293 1.293 1.293 1.305 1.305 1.317 1.317 1.317 1.317 1.330 1.330 1.330 1.330 1.343 1.343 1.343 1.343 1.343 1.356 1.370 1.370 1.370 1.384 1.384 1.384 1.384 1.384 1.384 1.384 1.384 1.398 1.398 1.398 1.398 1.398 1.398 1.398 1.398 1.398 1.398 1.414 1.414 1.414 1.414 1.414 1.430 1.430 1.430 1.430 1.430 1.430 1.430 1.430 1.430 1.430 1.447 1.447 1.447 1.447 1.447 1.447 1.447 1.447 1.447 1.447 1.465 1.465 1.465 1.465 1.465 1.465 1.465 1.465 1.465 1.484 1.484 1.484 1.484 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.527 1.527 1.527 1.527 1.527 1.527 1.552 1.552 1.552 1.552 1.552 1.552 1.552 1.552 1.552 1.552 1.552 1.552 1.579 1.579 1.579 1.579 1.579 1.579 1.579 1.579 1.579 1.579 1.579 1.579 1.579 1.579 1.610 1.610 1.610 1.610 1.610 1.610 1.610 1.610 1.610 1.610 1.644 1.644 1.644 1.644 1.644 1.644 1.644 1.644 1.644 1.644 1.644 1.644 1.644 1.644 1.685 1.685 1.685 1.685 1.685 1.685 1.734 1.734 1.734 1.734 1.734 1.734 1.734 1.795 1.795 1.795 1.795 1.795 1.795 1.795 2.016 2.016 2.016

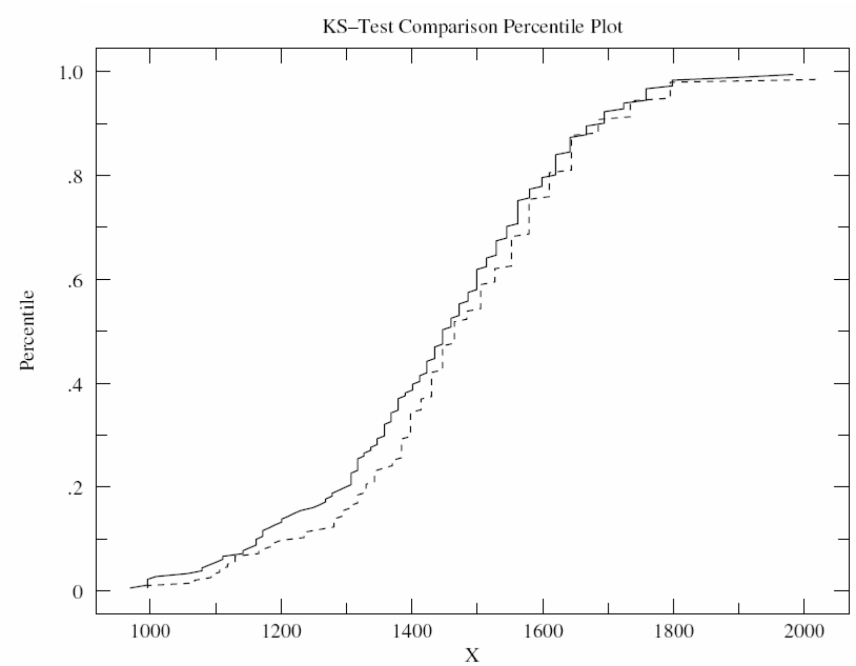
Appendix S

(continued)

School Level Assessment Score Comparison: 2004 -2005

School A - OVERALL RESULTS





The maximum difference between the cumulative distributions, *D*, is: 0.1196 with a corresponding *P* of: 0.128

2004

OVERALL

Scaled Score 1450

Advanced	68	38%	
Proficient	76	43%	81%
Basic	15	8%	
Below Basic	19	11%	19%
Total	178		

2005

OVERALL

Scaled Score 1472

Advanced	112	58%	
Proficient	53	28%	86%
Basic	12	6%	
Below Basic	15	8%	14%
Total	192		

Appendix S
(continued)

School Level Assessment Score Comparison: 2004 -2005

School A - OVERALL Non-Accelerated RESULTS

Data Set A: 2004

- 99 data points were entered
- Mean = 1.442
- 95% confidence interval for actual Mean: 1416. thru 1467.
- Standard Deviation = 129.
- High = 1.798 Low = 1.142
- Third Quartile = 1.529 First Quartile = 1.358
- Median = 1.447
- Average Absolute Deviation from Median = 101.

Data Set B: 2005

- 103 data points were entered
- Mean = 1.459
- 95% confidence interval for actual Mean: 1436. thru 1482.
- Standard Deviation = 118.
- High = 1.795 Low = 1.166
- Third Quartile = 1.552 First Quartile = 1.384
- Median = 1.447
- Average Absolute Deviation from Median = 93.1

Kolmogorov-Smirnov Comparison of Two Data Sets

The maximum difference between the cumulative distributions, *D*, is: 0.1100 with a corresponding *P* of: 0.550

Appendix S
(continued)

School Level Assessment Score Comparison: 2004 -2005

School A - OVERALL Non-Accelerated RESULTS

Items in Data Set 1: 2004

1.142 1.162 1.172 1.191 1.201 1.211 1.220 1.230 1.268 1.278 1.288 1.307 1.307 1.307 1.307 1.317 1.317 1.327 1.327 1.337 1.337 1.347 1.347 1.358 1.358 1.368 1.368 1.368 1.368 1.379 1.379 1.379 1.379 1.390 1.390 1.401 1.401 1.401 1.412 1.423 1.423 1.423 1.423 1.423 1.435 1.435 1.435 1.435 1.435 1.447 1.447 1.447 1.447 1.447 1.447 1.460 1.460 1.460 1.472 1.472 1.472 1.486 1.486 1.486 1.499 1.499 1.499 1.499 1.499 1.514 1.514 1.529 1.529 1.529 1.529 1.529 1.529 1.545 1.545 1.545 1.562 1.562 1.562 1.580 1.580 1.599 1.599 1.599 1.599 1.620 1.620 1.620 1.620 1.642 1.642 1.667 1.667 1.694 1.798

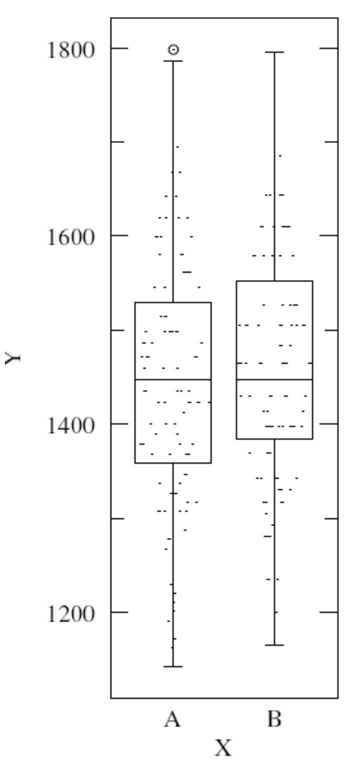
Items in Data Set 2: 2005

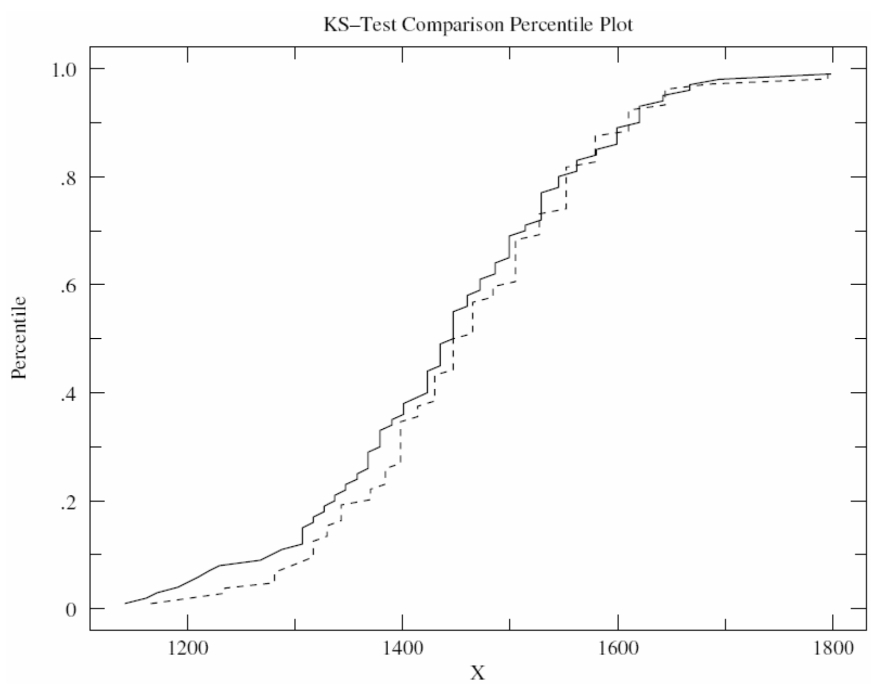
1.166 1.200 1.235 1.235 1.281 1.281 1.281 1.293 1.305 1.317 1.317 1.317 1.317 1.330 1.330 1.330 1.343 1.343 1.343 1.343 1.370 1.370 1.370 1.384 1.384 1.384 1.384 1.398 1.398 1.398 1.398 1.398 1.398 1.398 1.398 1.398 1.414 1.414 1.414 1.430 1.430 1.430 1.430 1.430 1.430 1.447 1.447 1.447 1.447 1.447 1.447 1.447 1.465 1.465 1.465 1.465 1.465 1.465 1.465 1.484 1.484 1.484 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.527 1.527 1.527 1.527 1.527 1.552 1.552 1.552 1.552 1.552 1.552 1.552 1.552 1.552 1.579 1.579 1.579 1.579 1.579 1.579 1.610 1.610 1.610 1.610 1.610 1.644 1.644 1.644 1.644 1.685 1.795 1.795

Appendix S
(continued)

School Level Assessment Score Comparison: 2004 -2005

School A - OVERALL Non-Accelerated RESULTS





The maximum difference between the cumulative distributions, *D*, is: 0.1100 with a corresponding *P* of: 0.550

2004

NON-ACCELERATED

Scaled Score 1448

Advanced	33	33%	
Proficient	57	56%	89%
Basic	8	8%	
Below Basic	3	3%	11%
Total	101		

2005

NON-ACCELERATED

Scaled Score 1476

Advanced	58	57%	
Proficient	36	36%	93%
Basic	6	6%	
Below Basic	1	1%	7%
Total	101		

Appendix S
(continued)

School Level Assessment Score Comparison: 2004 -2005

School A - OVERALL IEP RESULTS

Data Set A: 2004

- 34 data points were entered
- Mean = 1.198
- 95% confidence interval for actual Mean: 1146. thru 1250.
- Standard Deviation = 148.
- High = 1.620 Low = 969.
- Third Quartile = 1.310 First Quartile = 1.087
- Median = 1.172

Data Set B: 2005

- 31 data points were entered
- Mean = 1.221
- 95% confidence interval for actual Mean: 1167. thru 1274.
- Standard Deviation = 147.
- High = 1.644 Low = 996.
- Third Quartile = 1.330 First Quartile = 1.106
- Median = 1.189

Kolmogorov-Smirnov Comparison of Two Data Sets

The maximum difference between the cumulative distributions, *D*, is: 0.1357 with a corresponding *P* of: 0.905

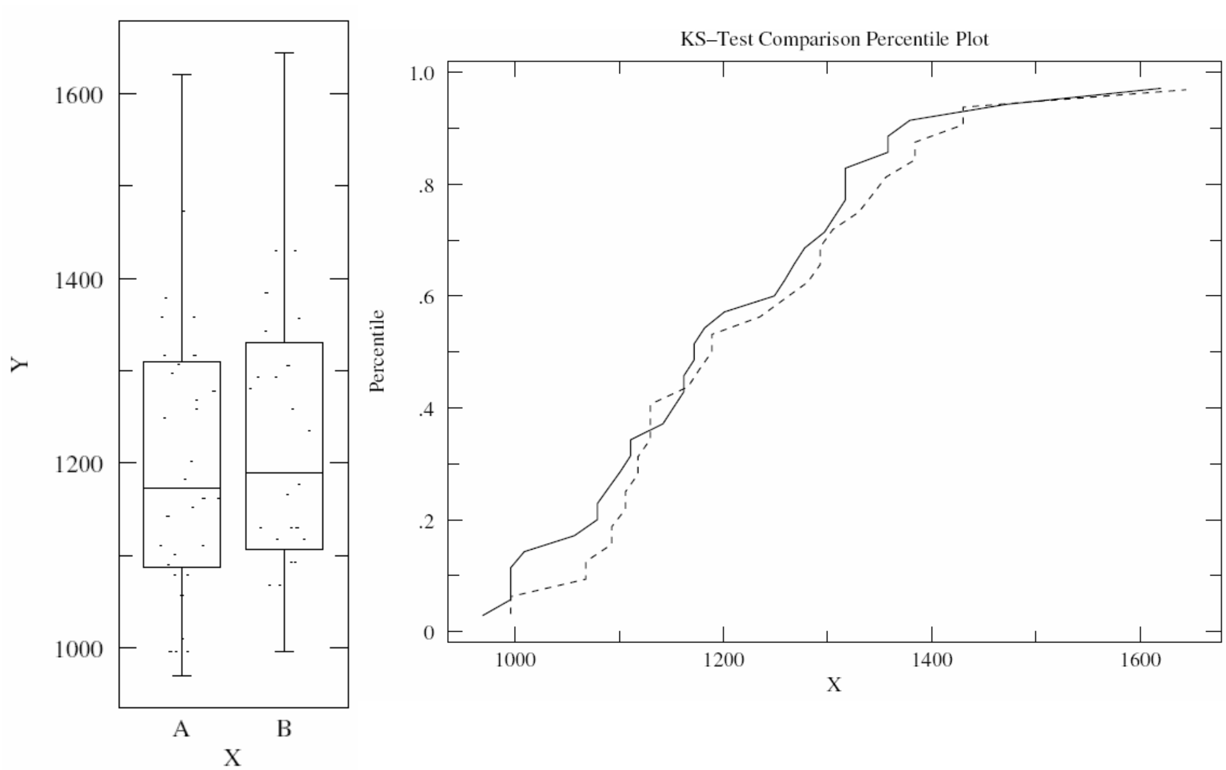
Items in Data Set 1: 2004
969. 996. 996. 996. 1.009 1.057 1.079 1.079 1.090 1.101 1.111 1.111 1.142 1.152 1.162 1.162 1.172 1.172 1.182 1.201 1.249 1.259 1.268 1.278 1.297 1.307 1.317 1.317 1.317 1.358 1.358 1.379 1.472 1.620

Items in Data Set 2: 2005
996. 996. 1.068 1.068 1.093 1.093 1.106 1.106 1.118 1.118 1.130 1.130 1.130 1.166 1.177 1.189 1.189 1.235 1.258 1.281 1.293 1.293 1.305 1.330 1.343 1.356 1.384 1.384 1.430 1.430 1.644

Appendix S
(continued)

School Level Assessment Score Comparison: 2004 -2005

School A - OVERALL IEP RESULTS



The maximum difference between the cumulative distributions, *D*, is: 0.1357 with a corresponding *P* of: 0.905

2004

IEP

Scaled Score 1200

Advanced	1	3%	
Proficient	8	24%	26%
Basic	7	21%	
Below Basic	18	53%	73%
Total	34		

2005

IEP

Scaled Score 1221

Advanced	1	3%	
Proficient	10	32%	35%
Basic	6	19%	
Below Basic	14	45%	65%
Total	31		

Appendix S
(continued)

School Level Assessment Score Comparison: 2004 -2005

School B - OVERALL RESULTS

Data Set A: 2004

- 282 data points were entered
- Mean = 1.421
- 95% confidence interval for actual Mean: 1398. thru 1445.
- Standard Deviation = 200.
- High = 1.983 Low = 940.
- Third Quartile = 1.562 First Quartile = 1.288
- Median = 1.423
- Average Absolute Deviation from Median = 161.

Data Set B: 2005

- 297 data points were entered
- Mean = 1.455
- 95% confidence interval for actual Mean: 1433. thru 1477.
- Standard Deviation = 194.
- High = 2.240 Low = 929.
- Third Quartile = 1.579 First Quartile = 1.330
- Median = 1.465
- Average Absolute Deviation from Median = 150.

Kolmogorov-Smirnov Comparison of Two Data Sets

The KS-test seeks differences between your two datasets; it is non-parametric and distribution free. Reject the null hypothesis of no difference between your datasets if *P* is "small".

The maximum difference between the cumulative distributions, *D*, is: 0.1182 with a corresponding *P* of: 0.032

Appendix S
(continued)

School Level Assessment Score Comparison: 2004 -2005

School B - OVERALL RESULTS

Items in Data Set 1: 2004
940. 969. 969. 1.022 1.022 1.022 1.034 1.034 1.034 1.057 1.057 1.079 1.079 1.079 1.090 1.090 1.101 1.111 1.122 1.122 1.122 1.132 1.132 1.132 1.152 1.152 1.152 1.162 1.162 1.172 1.172 1.172 1.172 1.172 1.182 1.191 1.191 1.191 1.191 1.201 1.201 1.201 1.201 1.211 1.211 1.211 1.211 1.211 1.220 1.220 1.220 1.220 1.230 1.230 1.230 1.249 1.249 1.249 1.259 1.259 1.259 1.259 1.268 1.268 1.268 1.268 1.278 1.278 1.278 1.288 1.288 1.288 1.288 1.288 1.297 1.297 1.297 1.297 1.297 1.297 1.297 1.297 1.297 1.307 1.307 1.307 1.307 1.307 1.307 1.307 1.317 1.317 1.317 1.327 1.327 1.327 1.327 1.327 1.337 1.347 1.347 1.347 1.347 1.358 1.368 1.368 1.368 1.368 1.379 1.379 1.379 1.379 1.379 1.379 1.379 1.379 1.379 1.390 1.390 1.390 1.390 1.390 1.390 1.390 1.390 1.390 1.390 1.401 1.401 1.401 1.401 1.401 1.412 1.412 1.412 1.412 1.412 1.412 1.412 1.423 1.423 1.423 1.423 1.423 1.423 1.423 1.423 1.423 1.435 1.435 1.435 1.435 1.435 1.435 1.447 1.447 1.447 1.447 1.447 1.447 1.447 1.460 1.460 1.460 1.460 1.460 1.460 1.460 1.460 1.460 1.460 1.472 1.472 1.472 1.472 1.472 1.472 1.472 1.472 1.472 1.486 1.486 1.499 1.499 1.499 1.499 1.499 1.514 1.514 1.514 1.514 1.514 1.514 1.514 1.514 1.529 1.529 1.529 1.529 1.529 1.529 1.529 1.529 1.545 1.545 1.545 1.545 1.545 1.545 1.545 1.562 1.562 1.562 1.562 1.562 1.580 1.580 1.580 1.580 1.580 1.580 1.580 1.580 1.580 1.580 1.580 1.599 1.599 1.599 1.620 1.620 1.620 1.620 1.620 1.642 1.642 1.642 1.642 1.642 1.642 1.642 1.667 1.667 1.667 1.667 1.667 1.667 1.667 1.667 1.667 1.667 1.694 1.694 1.694 1.694 1.694 1.694 1.724 1.724 1.724 1.724 1.724 1.724 1.724 1.724 1.758 1.758 1.758 1.758 1.758 1.758 1.798 1.798 1.798 1.798 1.798 1.798 1.798 1.845 1.845 1.903 1.983

Appendix S
(continued)

School Level Assessment Score Comparison: 2004 -2005

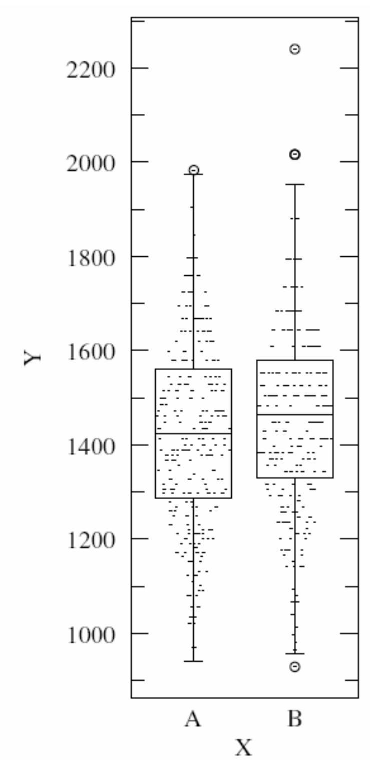
School B - OVERALL RESULTS

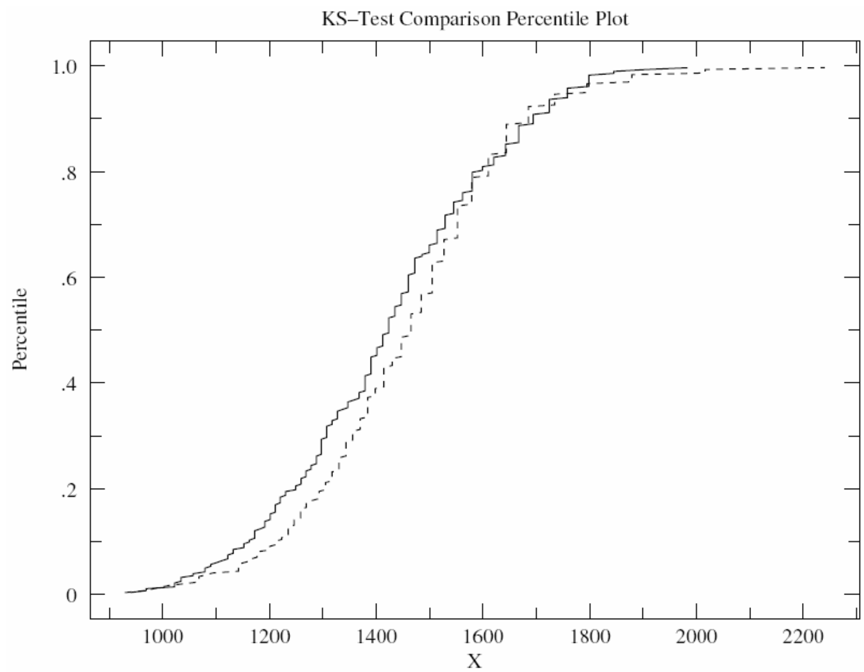
Items in Data Set 2: 2005
929. 964. 981. 996. 1.012 1.040 1.068 1.068 1.068 1.068 1.081 1.093 1.142 1.142 1.142 1.142 1.142 1.154 1.166 1.166 1.177 1.177 1.177 1.177 1.200 1.200 1.200 1.212 1.212 1.212 1.223 1.223 1.235 1.235 1.235 1.235 1.235 1.235 1.246 1.246 1.246 1.246 1.258 1.258 1.258 1.258 1.258 1.258 1.269 1.269 1.269 1.269 1.281 1.293 1.293 1.293 1.293 1.293 1.305 1.305 1.305 1.305 1.305 1.317 1.317 1.317 1.317 1.317 1.317 1.330 1.330 1.330 1.330 1.330 1.330 1.330 1.330 1.343 1.343 1.343 1.343 1.343 1.343 1.343 1.343 1.343 1.356 1.356 1.356 1.356 1.356 1.356 1.370 1.370 1.370 1.370 1.370 1.370 1.370 1.384 1.384 1.384 1.384 1.384 1.384 1.384 1.384 1.384 1.384 1.384 1.384 1.398 1.398 1.398 1.398 1.398 1.414 1.414 1.414 1.414 1.414 1.414 1.414 1.414 1.414 1.414 1.414 1.414 1.430 1.430 1.430 1.430 1.430 1.447 1.447 1.447 1.447 1.447 1.447 1.447 1.447 1.447 1.447 1.447 1.447 1.465 1.465 1.465 1.465 1.465 1.465 1.465 1.465 1.465 1.465 1.465 1.465 1.465 1.484 1.484 1.484 1.484 1.484 1.484 1.484 1.484 1.484 1.484 1.484 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.527 1.527 1.527 1.527 1.527 1.527 1.527 1.527 1.527 1.527 1.527 1.527 1.527 1.552 1.579 1.579 1.579 1.579 1.579 1.579 1.579 1.579 1.579 1.579 1.579 1.579 1.579 1.579 1.579 1.579 1.610 1.610 1.610 1.610 1.610 1.610 1.610 1.610 1.610 1.610 1.610 1.610 1.610 1.644 1.644 1.644 1.644 1.644 1.644 1.644 1.644 1.644 1.644 1.644 1.644 1.644 1.644 1.644 1.644 1.644 1.685 1.685 1.685 1.685 1.685 1.685 1.685 1.685 1.685 1.685 1.734 1.734 1.734 1.734 1.734 1.734 1.734 1.795 1.795 1.795 1.795 1.795 1.795 1.879 1.879 1.879 1.879 1.879 2.016 2.016 2.016 2.240

Appendix S
(continued)

School Level Assessment Score Comparison: 2004 -2005

School B - OVERALL RESULTS





The maximum difference between the cumulative distributions, *D*, is: 0.1182 with a corresponding *P* of: 0.032

2004

OVERALL
Scaled Score 1430

Advanced	95	34%	
Proficient	102	37%	71%
Basic	48	17%	
Below Basic	32	12%	29%
Total	277		

2005

OVERALL
Scaled Score 1455

Advanced	164	58%	
Proficient	80	27%	83%
Basic	31	11%	
Below Basic	19	6%	17%
Total	294		

Appendix S
(continued)

School Level Assessment Score Comparison: 2004 -2005

School B - OVERALL Non-Accelerated RESULTS

Data Set A: 2004

- 152 data points were entered
- Mean = 1.403
- 95% confidence interval for actual Mean: 1381. thru 1426.
- Standard Deviation = 139.
- High = 1.845 Low = 1.022
- Third Quartile = 1.486 First Quartile = 1.307
- Median = 1.401
- Average Absolute Deviation from Median = 108.

Data Set B: 2005

- 155 data points were entered
- Mean = 1.406
- 95% confidence interval for actual Mean: 1383. thru 1429.
- Standard Deviation = 145.
- High = 1.879 Low = 981.
- Third Quartile = 1.505 First Quartile = 1.330
- Median = 1.414
- Average Absolute Deviation from Median = 112.

KS Test: Results

Kolmogorov-Smirnov Comparison of Two Data Sets

The maximum difference between the cumulative distributions, *D*, is: 0.1170 with a corresponding *P* of: 0.229

Appendix S
(continued)

School Level Assessment Score Comparison: 2004 -2005

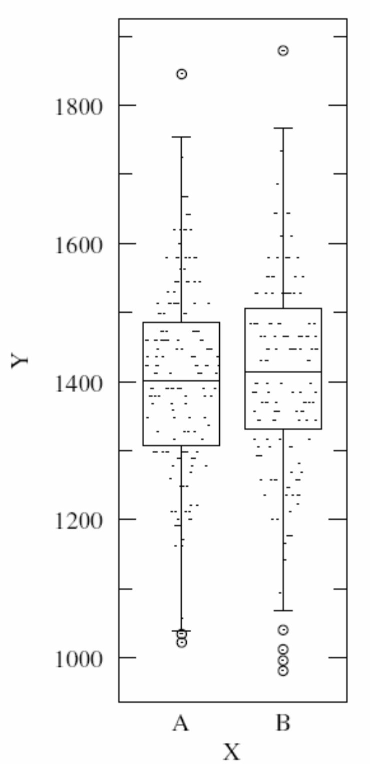
School B - OVERALL Non-Accelerated RESULTS

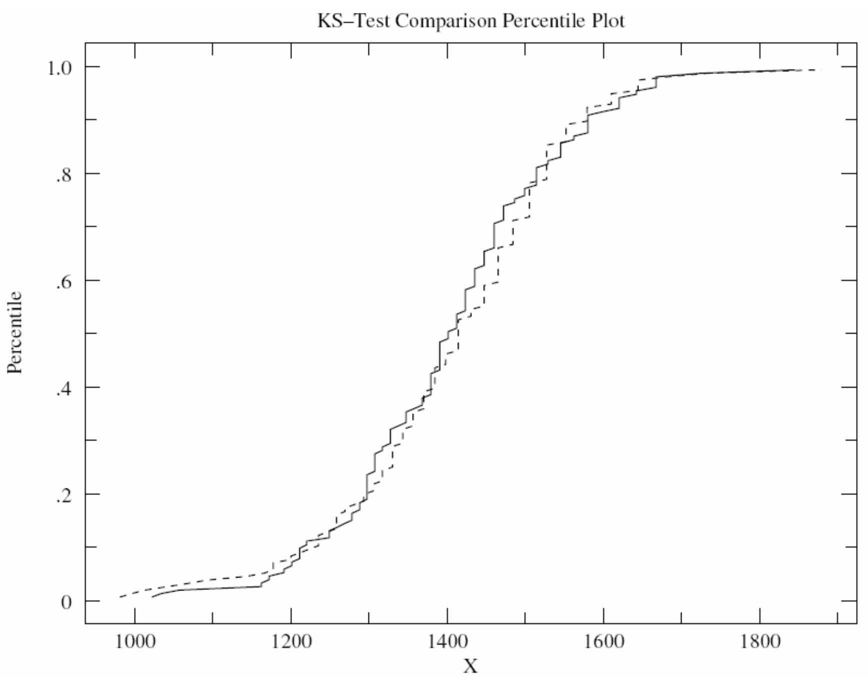
Items in Data Set 1: 2004
1.022 1.034 1.057 1.162 1.162 1.172 1.172 1.191 1.191 1.201 1.201 1.211 1.211 1.211 1.211 1.220 1.220 1.249 1.249 1.249 1.259 1.268 1.278 1.278 1.278 1.288 1.288 1.288 1.297 1.297 1.297 1.297 1.297 1.297 1.297 1.297 1.307 1.307 1.307 1.307 1.307 1.307 1.317 1.317 1.327 1.327 1.327 1.327 1.327 1.337 1.347 1.347 1.347 1.347 1.358 1.368 1.368 1.368 1.379 1.379 1.379 1.379 1.379 1.379 1.379 1.390 1.390 1.390 1.390 1.390 1.390 1.390 1.390 1.390 1.401 1.401 1.401 1.412 1.412 1.412 1.412 1.412 1.423 1.423 1.423 1.423 1.423 1.423 1.423 1.435 1.435 1.435 1.435 1.435 1.435 1.447 1.447 1.447 1.447 1.447 1.460 1.460 1.460 1.460 1.460 1.460 1.460 1.460 1.472 1.472 1.472 1.472 1.472 1.486 1.486 1.499 1.499 1.499 1.514 1.514 1.514 1.514 1.514 1.514 1.529 1.529 1.545 1.545 1.545 1.545 1.545 1.562 1.562 1.580 1.580 1.580 1.580 1.580 1.580 1.599 1.620 1.620 1.620 1.620 1.642 1.642 1.667 1.667 1.667 1.667 1.724 1.845

Items in Data Set 2: 2005
981. 996. 1.012 1.040 1.068 1.093 1.142 1.166 1.177 1.177 1.177 1.200 1.200 1.212 1.223 1.235 1.235 1.235 1.235 1.246 1.258 1.258 1.258 1.258 1.258 1.269 1.269 1.281 1.293 1.293 1.293 1.305 1.305 1.305 1.317 1.317 1.317 1.317 1.330 1.330 1.330 1.330 1.330 1.330 1.330 1.343 1.343 1.343 1.343 1.343 1.356 1.356 1.356 1.356 1.356 1.370 1.370 1.370 1.370 1.370 1.370 1.384 1.384 1.384 1.384 1.384 1.384 1.384 1.398 1.398 1.398 1.398 1.414 1.414 1.414 1.414 1.414 1.414 1.414 1.414 1.414 1.414 1.430 1.430 1.430 1.447 1.447 1.447 1.447 1.447 1.447 1.447 1.465 1.465 1.465 1.465 1.465 1.465 1.465 1.465 1.465 1.465 1.465 1.484 1.484 1.484 1.484 1.484 1.484 1.484 1.484 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.527 1.527 1.527 1.527 1.527 1.527 1.527 1.527 1.527 1.527 1.527 1.552 1.552 1.552 1.552 1.552 1.552 1.579 1.579 1.579 1.579 1.579 1.610 1.610 1.610 1.610 1.644 1.644 1.644 1.644 1.685 1.734 1.879

Appendix S
(continued)

School B - OVERALL Non-Accelerated RESULTS





The maximum difference between the cumulative distributions, *D*, is: 0.1170 with a corresponding *P* of: 0.229

2004

NON-ACCELERATED

Scaled Score 1403

Advanced	34	23%	
Proficient	79	53%	76%
Basic	29	19%	
Below Basic	7	5%	24%
Total	149		

2005

NON-ACCELERATED

Scaled Score 1406

Advanced	70	45%	
Proficient	57	37%	82%
Basic	20	13%	
Below Basic	8	5%	18%
Total	155		

Appendix S
(continued)

School B - OVERALL IEP RESULTS

Data Set A: 2004

- 56 data points were entered
- Mean = 1.198
- 95% confidence interval for actual Mean: 1161. thru 1235.
- Standard Deviation = 138.
- High = 1.694 Low = 940.
- Third Quartile = 1.268 First Quartile = 1.104
- Median = 1.187
- Average Absolute Deviation from Median = 106.

Data Set B: 2005

- 50 data points were entered
- Mean = 1.258
- 95% confidence interval for actual Mean: 1213. thru 1302.
- Standard Deviation = 157.
- High = 1.644 Low = 868.
- Third Quartile = 1.350 First Quartile = 1.151
- Median = 1.264
- Average Absolute Deviation from Median = 122.

KS Test: Results

Kolmogorov-Smirnov Comparison of Two Data Sets

The maximum difference between the cumulative distributions, D, is: 0.2807 with a corresponding P of: 0.025

Appendix S
(continued)

School B - OVERALL IEP RESULTS

Items in Data Set 1: 2004

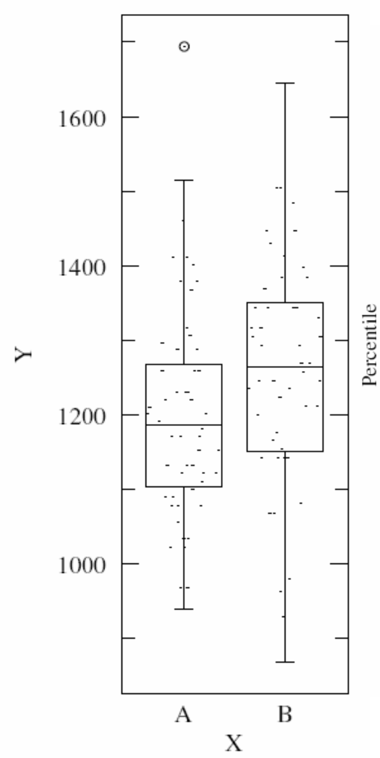
940. 969. 969. 1.022 1.022 1.034 1.034 1.057 1.079 1.079 1.079 1.090 1.090 1.101 1.111
1.122 1.122 1.122 1.132 1.132 1.132 1.152 1.152 1.152 1.172 1.172 1.172 1.182 1.191
1.201 1.201 1.211 1.220 1.220 1.230 1.230 1.230 1.259 1.259 1.259 1.268 1.268 1.268
1.288 1.288 1.297 1.307 1.317 1.368 1.379 1.379 1.401 1.412 1.412 1.460 1.694

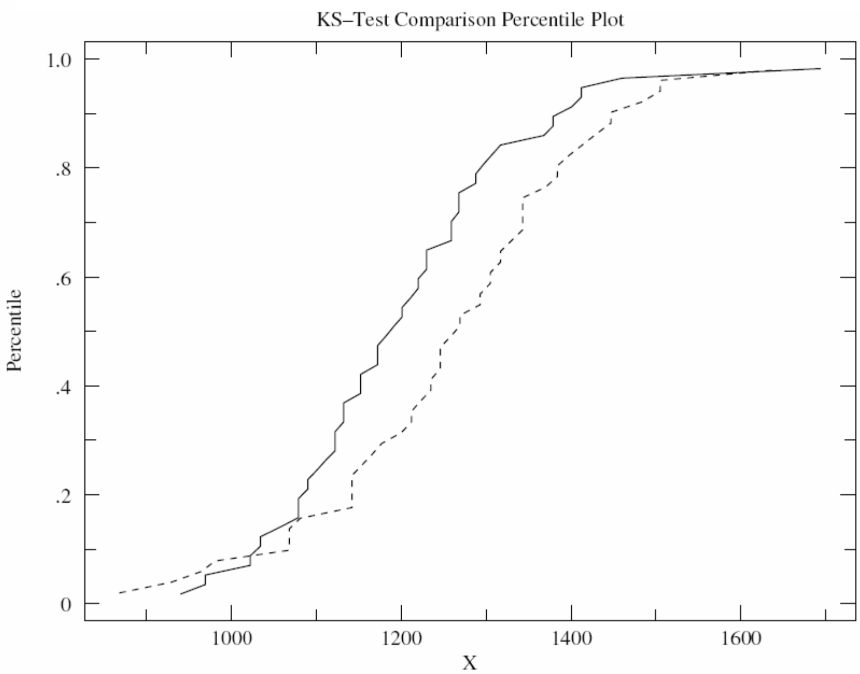
Items in Data Set 2: 2005

868. 929. 964. 981. 1.068 1.068 1.068 1.081 1.142 1.142 1.142 1.142 1.154 1.166 1.177
1.200 1.212 1.212 1.223 1.235 1.235 1.246 1.246 1.246 1.258 1.269 1.269 1.293 1.293
1.305 1.305 1.317 1.317 1.330 1.343 1.343 1.343 1.343 1.370 1.384 1.384 1.398 1.414
1.430 1.447 1.447 1.484 1.505 1.505 1.644

Appendix S
(continued)

School B - OVERALL IEP RESULTS





The maximum difference between the cumulative distributions, *D*, is: 0.2807 with a corresponding *P* of: 0.025

2004

IEP
Scaled Score 1200

Advanced	1	2%	
Proficient	9	17%	19%
Basic	19	35%	
Below Basic	25	46%	81%
Total	54		

2005

IEP
Scaled Score 1272

Advanced	6	13%	
Proficient	17	38%	49%
Basic	11	24%	
Below Basic	11	24%	51%
Total	45		

Appendix S
(continued)

School C - OVERALL RESULTS

Data Set A: 2004

- 177 data points were entered
- Mean = 1.424
- 95% confidence interval for actual Mean: 1396. thru 1453.
- Standard Deviation = 190.
- High = 1.903 Low = 955.
- Third Quartile = 1.562 First Quartile = 1.297
- Median = 1.423
- Average Absolute Deviation from Median = 153.

Data Set B: 2005

- 185 data points were entered
- Mean = 1.489
- 95% confidence interval for actual Mean: 1460. thru 1519.
- Standard Deviation = 203.
- High = 2.016 Low = 964.
- Third Quartile = 1.627 First Quartile = 1.356
- Median = 1.505
- Average Absolute Deviation from Median = 155.

KS Test: Results

Kolmogorov-Smirnov Comparison of Two Data Sets

The KS-test seeks differences between your two datasets; it is non-parametric and distribution free. Reject the null hypothesis of no difference between your datasets if *P* is "small".

The maximum difference between the cumulative distributions, *D*, is: 0.2257 with a corresponding *P* of: 0.000

Appendix S
(continued)

School C - OVERALL RESULTS

Items in Data Set 1: 2004

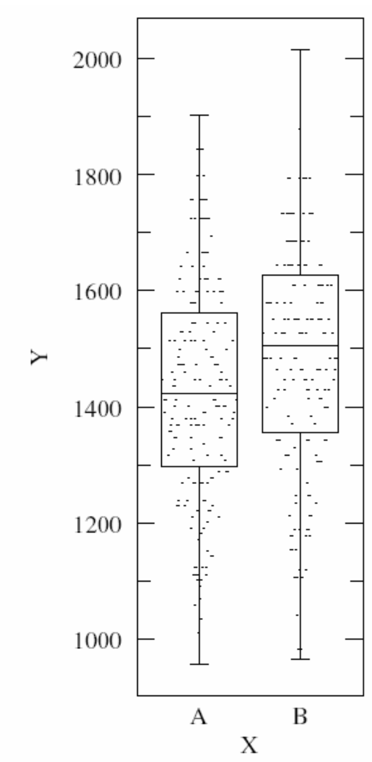
955. 1.009 1.034 1.057 1.068 1.090 1.101 1.101 1.111 1.111 1.111 1.111 1.122 1.122 1.122 1.142 1.152 1.172 1.182 1.191 1.191 1.201 1.201 1.211 1.211 1.220 1.220 1.220 1.230 1.230 1.230 1.239 1.239 1.239 1.268 1.268 1.268 1.268 1.268 1.278 1.278 1.288 1.288 1.297 1.297 1.297 1.297 1.297 1.297 1.307 1.307 1.317 1.317 1.317 1.327 1.327 1.337 1.347 1.347 1.347 1.358 1.358 1.368 1.368 1.368 1.368 1.368 1.368 1.368 1.379 1.379 1.379 1.379 1.379 1.379 1.390 1.390 1.390 1.401 1.401 1.401 1.401 1.401 1.412 1.412 1.412 1.412 1.412 1.423 1.423 1.423 1.423 1.423 1.435 1.435 1.435 1.447 1.447 1.447 1.447 1.447 1.447 1.460 1.460 1.460 1.472 1.472 1.472 1.472 1.472 1.472 1.486 1.486 1.499 1.499 1.499 1.514 1.514 1.514 1.514 1.514 1.514 1.514 1.529 1.529 1.529 1.545 1.545 1.545 1.545 1.545 1.562 1.562 1.562 1.562 1.580 1.580 1.580 1.599 1.599 1.599 1.599 1.599 1.599 1.599 1.599 1.599 1.620 1.620 1.620 1.620 1.620 1.620 1.642 1.642 1.642 1.667 1.667 1.667 1.667 1.667 1.694 1.724 1.724 1.724 1.724 1.724 1.724 1.758 1.758 1.758 1.758 1.798 1.798 1.845 1.845 1.903

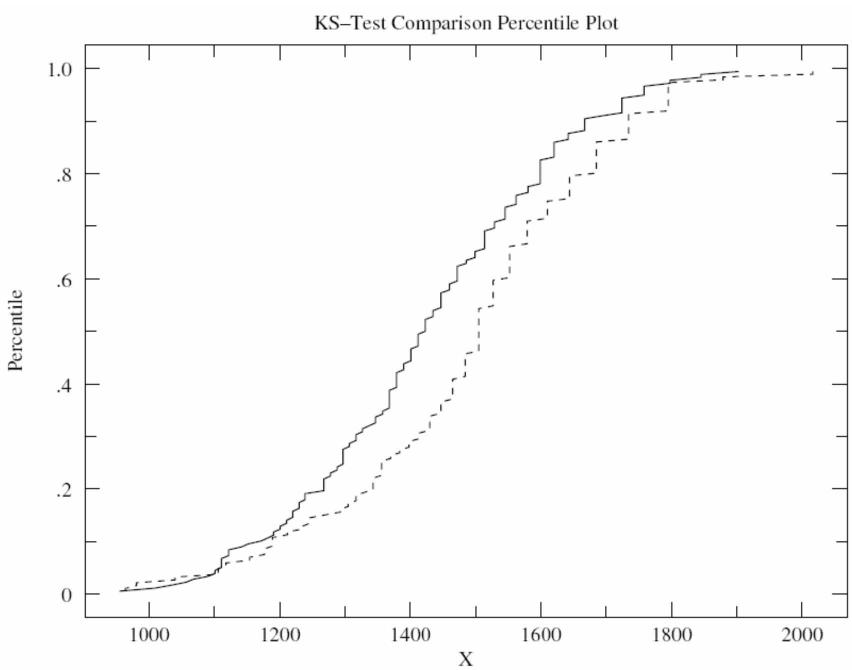
Items in Data Set 2: 2005

964. 964. 981. 981. 1.040 1.040 1.106 1.106 1.106 1.118 1.118 1.154 1.154 1.177 1.177 1.177 1.189 1.189 1.189 1.189 1.212 1.212 1.235 1.235 1.246 1.246 1.246 1.269 1.293 1.293 1.305 1.305 1.317 1.317 1.317 1.330 1.343 1.343 1.343 1.343 1.343 1.356 1.356 1.356 1.356 1.356 1.356 1.370 1.370 1.384 1.384 1.398 1.398 1.398 1.414 1.414 1.414 1.430 1.430 1.430 1.430 1.430 1.430 1.447 1.447 1.447 1.447 1.447 1.465 1.465 1.465 1.465 1.465 1.465 1.465 1.465 1.484 1.484 1.484 1.484 1.484 1.484 1.484 1.484 1.484 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.527 1.527 1.527 1.527 1.527 1.527 1.527 1.527 1.527 1.527 1.552 1.552 1.552 1.552 1.552 1.552 1.552 1.552 1.552 1.552 1.552 1.552 1.579 1.579 1.579 1.579 1.579 1.579 1.579 1.579 1.579 1.610 1.610 1.610 1.610 1.610 1.610 1.610 1.644 1.644 1.644 1.644 1.644 1.644 1.644 1.644 1.644 1.685 1.685 1.685 1.685 1.685 1.685 1.685 1.685 1.685 1.685 1.685 1.685 1.734 1.734 1.734 1.734 1.734 1.734 1.734 1.734 1.734 1.734 1.795 1.795 1.795 1.795 1.795 1.795 1.795 1.795 1.795 1.795 1.795 1.879 1.879 2.016 2.016

Appendix S
(continued)

School C - OVERALL RESULTS





The maximum difference between the cumulative distributions, *D*, is: 0.2257 with a corresponding *P* of: 0.000

2004

OVERALL
Scaled Score 1430

Advanced	66	38%	
Proficient	63	36%	74%
Basic	31	18%	
Below Basic	16	9%	27%
Total	176		

2005

OVERALL
Scaled Score 1481

Advanced	121	66%	
Proficient	34	18%	84%
Basic	16	9%	
Below Basic	13	7%	16%
Total	184		

Appendix S
(continued)

School C - OVERALL Non-Accelerated RESULTS

Data Set A: 2004

- 109 data points were entered
- Mean = 1.392
- 95% confidence interval for actual Mean: 1365. thru 1419.
- Standard Deviation = 142.
- High = 1.903 Low = 1.034
- Third Quartile = 1.472 First Quartile = 1.297
- Median = 1.390
- Average Absolute Deviation from Median = 108.

Data Set B: 2005

- 93 data points were entered
- Mean = 1.487
- 95% confidence interval for actual Mean: 1462. thru 1512.
- Standard Deviation = 123.
- High = 1.795 Low = 1.154
- Third Quartile = 1.552 First Quartile = 1.406
- Median = 1.505
- Average Absolute Deviation from Median = 94.1

KS Test: Results

Kolmogorov-Smirnov Comparison of Two Data Sets

The maximum difference between the cumulative distributions, *D*, is: 0.3699 with a corresponding *P* of: 0.000

Appendix S
(continued)

School C - OVERALL Non-Accelerated RESULTS

Items in Data Set 1: 2004

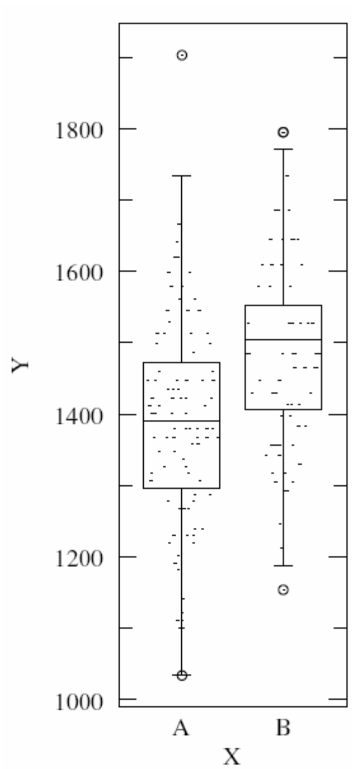
1.034 1.101 1.101 1.111 1.111 1.122 1.142 1.182 1.191 1.201 1.220 1.220 1.230 1.230
1.230 1.239 1.239 1.268 1.268 1.268 1.278 1.278 1.288 1.288 1.297 1.297 1.297 1.297
1.297 1.307 1.307 1.317 1.317 1.327 1.327 1.337 1.347 1.347 1.358 1.358 1.368 1.368
1.368 1.368 1.368 1.368 1.379 1.379 1.379 1.379 1.379 1.379 1.390 1.390 1.390 1.401
1.401 1.401 1.401 1.412 1.412 1.412 1.412 1.423 1.423 1.423 1.423 1.423 1.435 1.435
1.435 1.447 1.447 1.447 1.447 1.447 1.447 1.460 1.460 1.472 1.472 1.472 1.472 1.472
1.486 1.499 1.499 1.514 1.514 1.514 1.514 1.514 1.529 1.545 1.545 1.545 1.562 1.562
1.580 1.580 1.599 1.599 1.599 1.620 1.620 1.642 1.667 1.667 1.903

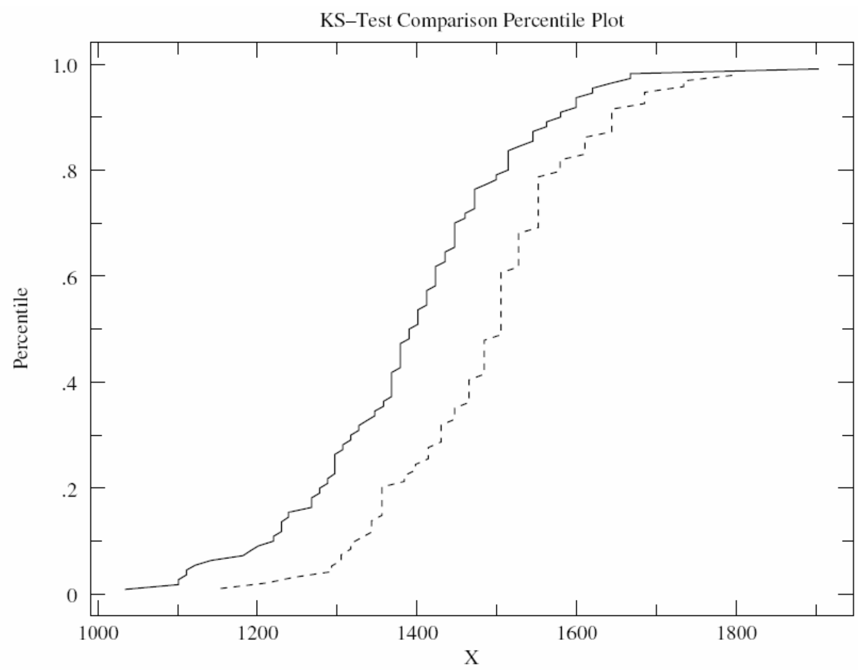
Items in Data Set 2: 2005

1.154 1.212 1.246 1.293 1.293 1.305 1.305 1.317 1.317 1.330 1.343 1.343 1.343 1.356
1.356 1.356 1.356 1.356 1.356 1.384 1.384 1.398 1.398 1.414 1.414 1.414 1.430 1.430
1.430 1.430 1.447 1.447 1.447 1.465 1.465 1.465 1.465 1.465 1.484 1.484 1.484 1.484
1.484 1.484 1.484 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505
1.505 1.527 1.527 1.527 1.527 1.527 1.527 1.527 1.552 1.552 1.552 1.552 1.552 1.552
1.552 1.552 1.552 1.552 1.579 1.579 1.579 1.610 1.610 1.610 1.610 1.644 1.644 1.644
1.644 1.644 1.685 1.685 1.685 1.734 1.734 1.795 1.795

Appendix S
(continued)

School C - OVERALL Non-Accelerated RESULTS





The maximum difference between the cumulative distributions, *D*, is: 0.3699 with a corresponding *P* of: 0.000

2004

NON-ACCELERATED

Scaled Score 1392

Advanced	20	20%	
Proficient	54	53%	73%
Basic	22	20%	
Below Basic	6	7%	27%
Total	102		

2005

NON-ACCELERATED

Scaled Score 1470

Advanced	62	67%	
Proficient	27	29%	97%
Basic	2	2%	
Below Basic	1	1%	3%
Total	92		

Appendix S
(continued)

School C - OVERALL IEP RESULTS

Data Set A: 2004

- 26 data points were entered
- Mean = 1.215
- 95% confidence interval for actual Mean: 1157. thru 1274.
- Standard Deviation = 145.
- High = 1.580 Low = 955.
- Third Quartile = 1.302 First Quartile = 1.111
- Median = 1.206
- Average Absolute Deviation from Median = 110.

Data Set B:

- 39 data points were entered
- Mean = 1.256
- 95% confidence interval for actual Mean: 1196. thru 1317.
- Standard Deviation = 186.
- High = 1.795 Low = 964.
- Third Quartile = 1.430 First Quartile = 1.118
- Median = 1.235
- Average Absolute Deviation from Median = 148.

KS Test: Results

Kolmogorov-Smirnov Comparison of Two Data Sets

The maximum difference between the cumulative distributions, *D*, is: 0.1795 with a corresponding *P* of: 0.652

Items in Data Set 1: 2004

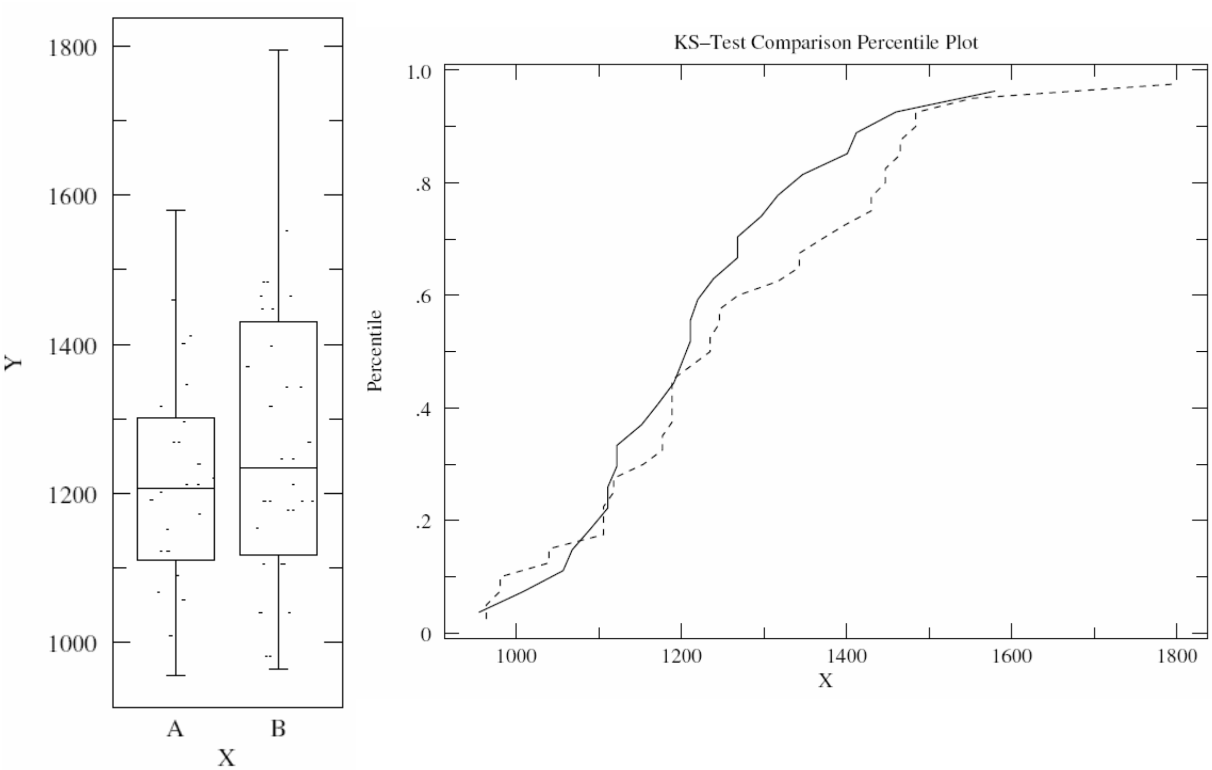
955. 1.009 1.057 1.068 1.090 1.111 1.111 1.122 1.122 1.152 1.172 1.191 1.201 1.211 1.211 1.220 1.239 1.268 1.268 1.297 1.317 1.347 1.401 1.412 1.460 1.580

Items in Data Set 2: 2005

964. 964. 981. 981. 1.040 1.040 1.106 1.106 1.106 1.118 1.118 1.154 1.177 1.177 1.189 1.189 1.189 1.189 1.212 1.235 1.235 1.246 1.246 1.269 1.317 1.343 1.343 1.370 1.398 1.430 1.430 1.447 1.447 1.465 1.465 1.484 1.484 1.552 1.795

Appendix S
(continued)

School C - OVERALL IEP RESULTS



The maximum difference between the cumulative distributions, *D*, is: 0.1795 with a corresponding *P* of: 0.652

2004

IEP
Scaled Score 1215

Advanced	1	4%	
Proficient	5	20%	24%
Basic	9	36%	
Below Basic	10	40%	76%
Total	25		

2005

IEP
Scaled Score 1254

Advanced	8	20%	
Proficient	7	18%	38%
Basic	13	33%	
Below Basic	12	30%	62%
Total	40		

Appendix S
(continued)

School D - OVERALL RESULTS

Data Set A:

- 168 data points were entered
- Mean = 1.358
- 95% confidence interval for actual Mean: 1331. thru 1386.
- Standard Deviation = 182.
- High = 1.798 Low = 925.
- Third Quartile = 1.499 First Quartile = 1.223
- Median = 1.358
- Average Absolute Deviation from Median = 150.

Data Set B:

- 176 data points were entered
- Mean = 1.453
- 95% confidence interval for actual Mean: 1423. thru 1482.
- Standard Deviation = 197.
- High = 2.016 Low = 1.012
- Third Quartile = 1.579 First Quartile = 1.317
- Median = 1.447
- Average Absolute Deviation from Median = 154.

KS Test: Results

Kolmogorov-Smirnov Comparison of Two Data Sets

The KS-test seeks differences between your two datasets; it is non-parametric and distribution free. Reject the null hypothesis of no difference between your datasets if P is "small".

The maximum difference between the cumulative distributions, D, is: 0.2289 with a corresponding P of: 0.000

Appendix S
(continued)

School D - OVERALL RESULTS

Items in Data Set 1: 2004

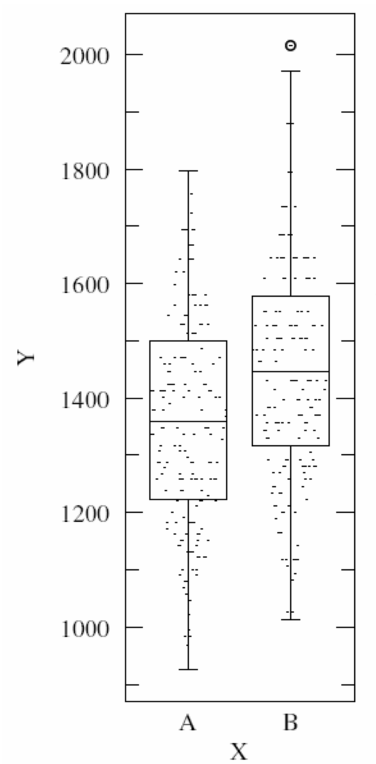
925. 969. 983. 983. 996. 1.022 1.046 1.057 1.068 1.079 1.090 1.090 1.101 1.101 1.101
1.122 1.122 1.132 1.132 1.132 1.142 1.142 1.152 1.152 1.152 1.162 1.162 1.162 1.162
1.172 1.172 1.182 1.182 1.182 1.182 1.182 1.191 1.201 1.211 1.220 1.220 1.220 1.230
1.239 1.239 1.239 1.259 1.259 1.259 1.259 1.259 1.259 1.259 1.259 1.259 1.268 1.268
1.268 1.278 1.288 1.288 1.288 1.288 1.288 1.288 1.297 1.307 1.307 1.307 1.317 1.317
1.317 1.327 1.337 1.337 1.337 1.337 1.347 1.347 1.347 1.347 1.347 1.358 1.358 1.358
1.358 1.368 1.379 1.379 1.379 1.379 1.379 1.390 1.401 1.401 1.401 1.401 1.401 1.412
1.412 1.412 1.412 1.412 1.412 1.412 1.423 1.423 1.423 1.423 1.423 1.423 1.447 1.447
1.447 1.460 1.460 1.460 1.460 1.472 1.472 1.472 1.472 1.472 1.486 1.499 1.499 1.499
1.499 1.499 1.499 1.514 1.514 1.514 1.514 1.529 1.529 1.529 1.529 1.545 1.545 1.545
1.562 1.562 1.562 1.562 1.562 1.562 1.562 1.580 1.580 1.580 1.580 1.599 1.620 1.620
1.642 1.642 1.642 1.642 1.667 1.667 1.694 1.694 1.694 1.694 1.724 1.758 1.798

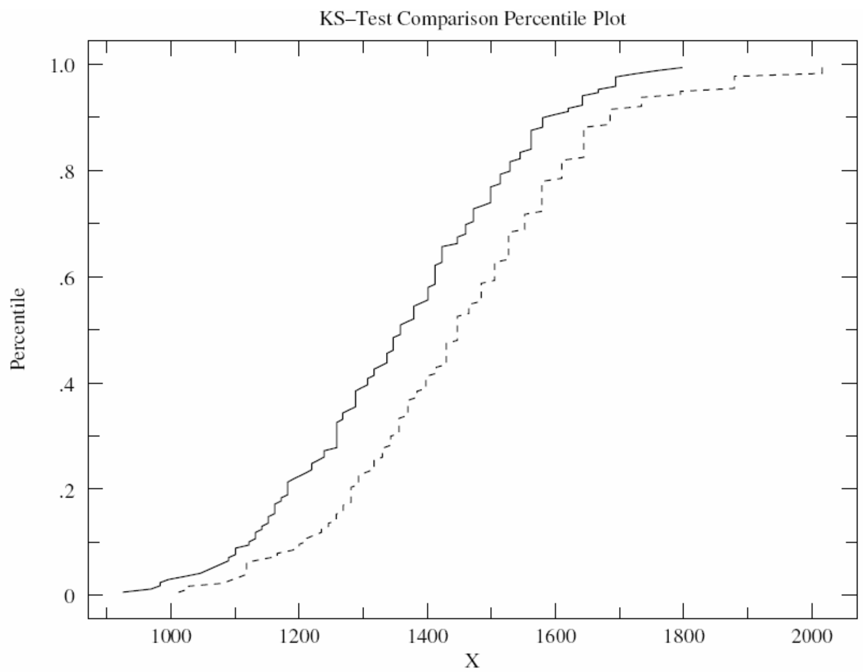
Items in Data Set 2: 2005

1.012 1.026 1.026 1.081 1.093 1.106 1.118 1.118 1.118 1.118 1.118 1.142 1.166 1.166
1.189 1.200 1.200 1.212 1.212 1.223 1.235 1.235 1.246 1.246 1.258 1.258 1.258 1.269
1.269 1.269 1.281 1.281 1.281 1.281 1.281 1.281 1.293 1.293 1.293 1.293 1.305 1.317
1.317 1.317 1.317 1.330 1.330 1.330 1.330 1.343 1.343 1.343 1.343 1.356 1.356 1.356
1.356 1.356 1.356 1.370 1.370 1.370 1.370 1.370 1.370 1.384 1.384 1.384 1.398 1.398
1.398 1.398 1.398 1.414 1.414 1.414 1.430 1.430 1.430 1.430 1.430 1.430 1.430 1.430
1.447 1.447 1.447 1.447 1.447 1.447 1.447 1.447 1.447 1.465 1.465 1.465 1.465 1.484
1.484 1.484 1.484 1.484 1.484 1.484 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.527
1.527 1.527 1.527 1.527 1.527 1.527 1.527 1.527 1.527 1.552 1.552 1.552 1.552 1.552
1.552 1.579 1.579 1.579 1.579 1.579 1.579 1.579 1.579 1.579 1.579 1.579 1.610 1.610
1.610 1.610 1.610 1.610 1.610 1.644 1.644 1.644 1.644 1.644 1.644 1.644 1.644 1.644
1.644 1.644 1.685 1.685 1.685 1.685 1.685 1.685 1.734 1.734 1.734 1.734 1.795 1.795
1.879 1.879 1.879 1.879 1.879 2.016 2.016 2.016

Appendix S
(continued)

School D - OVERALL RESULTS





The maximum difference between the cumulative distributions, *D*, is: 0.2289 with a corresponding *P* of: 0.000

2004

OVERALL
Scaled Score 1360

Advanced	36	22%	
Proficient	61	38%	60%
Basic	35	22%	
Below Basic	29	18%	40%
Total	161		

2005

OVERALL
Scaled Score 1452

Advanced	92	52%	
Proficient	48	27%	80%
Basic	23	13%	
Below Basic	13	7%	20%
Total	176		

Appendix S
(continued)

School D - OVERALL Non-Accelerated RESULTS

Data Set A: 2004

- 115 data points were entered
- Mean = 1.380
- 95% confidence interval for actual Mean: 1354. thru 1406.
- Standard Deviation = 141.
- High = 1.694 Low = 1.132
- Third Quartile = 1.472 First Quartile = 1.268
- Median = 1.379
- Average Absolute Deviation from Median = 115.

Data Set B: 2005

- 107 data points were entered
- Mean = 1.435
- 95% confidence interval for actual Mean: 1410. thru 1459.
- Standard Deviation = 128.
- High = 1.685 Low = 1.118
- Third Quartile = 1.527 First Quartile = 1.343
- Median = 1.447
- Average Absolute Deviation from Median = 104.

KS Test: Results

Kolmogorov-Smirnov Comparison of Two Data Sets

The maximum difference between the cumulative distributions, *D*, is: 0.2390 with a corresponding *P* of: 0.003

Appendix S
(continued)

School D - OVERALL Non-Accelerated RESULTS

Items in Data Set 1: 2004

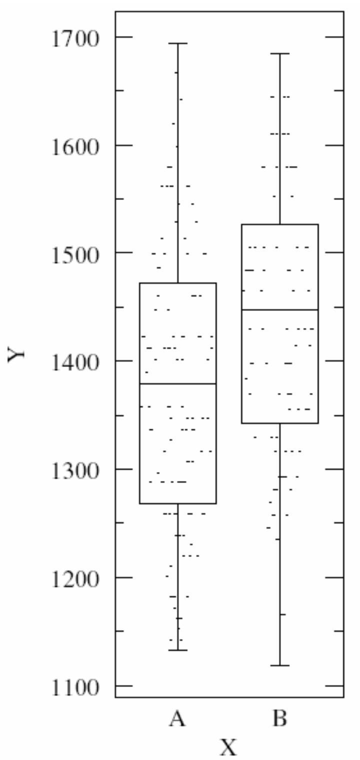
1.132 1.132 1.142 1.142 1.152 1.162 1.162 1.172 1.182 1.182 1.182 1.201 1.211 1.220
1.220 1.220 1.230 1.239 1.239 1.239 1.259 1.259 1.259 1.259 1.259 1.259 1.259 1.259
1.268 1.268 1.268 1.288 1.288 1.288 1.288 1.288 1.288 1.297 1.307 1.307 1.317 1.317
1.317 1.327 1.337 1.337 1.337 1.337 1.347 1.347 1.347 1.347 1.347 1.358 1.358 1.358
1.358 1.379 1.379 1.379 1.379 1.390 1.401 1.401 1.401 1.401 1.412 1.412 1.412 1.412
1.412 1.412 1.412 1.423 1.423 1.423 1.423 1.423 1.447 1.447 1.460 1.460 1.460 1.460
1.472 1.472 1.472 1.472 1.486 1.499 1.499 1.499 1.499 1.514 1.514 1.529 1.529 1.545
1.545 1.562 1.562 1.562 1.562 1.562 1.580 1.580 1.599 1.620 1.642 1.642 1.667 1.667
1.694 1.694 1.694

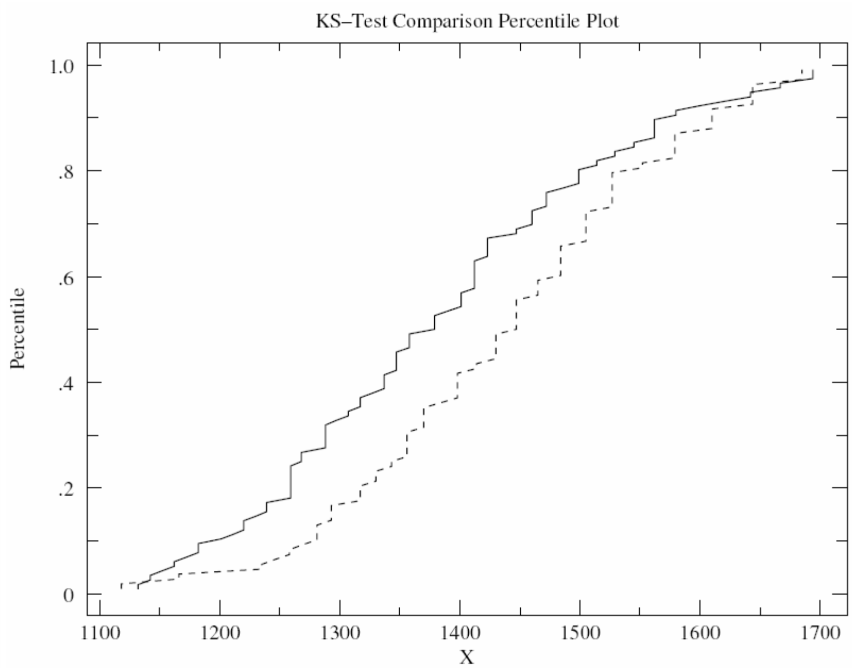
Items in Data Set 2: 2005

1.118 1.118 1.166 1.166 1.235 1.235 1.246 1.258 1.258 1.269 1.281 1.281 1.281 1.281
1.293 1.293 1.293 1.293 1.317 1.317 1.317 1.317 1.330 1.330 1.330 1.343 1.343 1.356
1.356 1.356 1.356 1.356 1.356 1.370 1.370 1.370 1.370 1.370 1.384 1.398 1.398 1.398
1.398 1.398 1.398 1.414 1.414 1.430 1.430 1.430 1.430 1.430 1.430 1.447 1.447 1.447
1.447 1.447 1.447 1.447 1.465 1.465 1.465 1.465 1.484 1.484 1.484 1.484 1.484 1.484
1.484 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.527 1.527 1.527 1.527 1.527 1.527
1.527 1.527 1.552 1.552 1.579 1.579 1.579 1.579 1.579 1.579 1.610 1.610 1.610 1.610
1.610 1.644 1.644 1.644 1.644 1.644 1.685 1.685 1.685

Appendix S
(continued)

School D - OVERALL Non-Accelerated RESULTS





The maximum difference between the cumulative distributions, *D*, is: 0.2390 with a corresponding *P* of: 0.003

2004

NON-ACCELERATED

Scaled Score 1383

Advanced	21	19%	
Proficient	54	49%	68%
Basic	30	27%	
Below Basic	6	5%	32%
Total	111		

2005

NON-ACCELERATED

Scaled Score 1435

Advanced	54	51%	
Proficient	36	34%	85%
Basic	13	12%	
Below Basic	2	2%	15%
Total	105		

Appendix S
(continued)

School D - OVERALL IEP RESULTS

Data Set A: 2004

- 34 data points were entered
- Mean = 1.157
- 95% confidence interval for actual Mean: 1106. thru 1208.
- Standard Deviation = 146.
- High = 1.580 Low = 925.
- Third Quartile = 1.208 First Quartile = 1.065
- Median = 1.127
- Average Absolute Deviation from Median = 107.

Data Set B: 2005

- 34 data points were entered
- Mean = 1.247
- 95% confidence interval for actual Mean: 1200. thru 1293.
- Standard Deviation = 134.
- High = 1.527 Low = 1.012
- Third Quartile = 1.350 First Quartile = 1.118
- Median = 1.252
- Average Absolute Deviation from Median = 110.

KS Test: Results

Kolmogorov-Smirnov Comparison of Two Data Sets

The maximum difference between the cumulative distributions, *D*, is: 0.4412 with a corresponding *P* of: 0.002

Items in Data Set 1: 2004

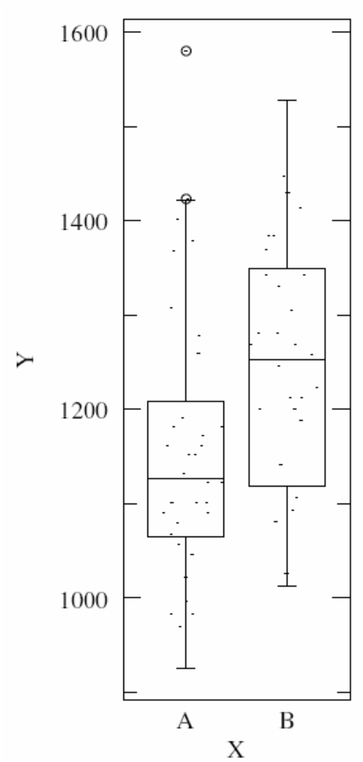
925. 969. 983. 983. 996. 1.022 1.046 1.057 1.068 1.079 1.090 1.090 1.101 1.101 1.101 1.122 1.122 1.132 1.152 1.152 1.162 1.162 1.172 1.182 1.182 1.191 1.259 1.278 1.307 1.368 1.379 1.401 1.423 1.580

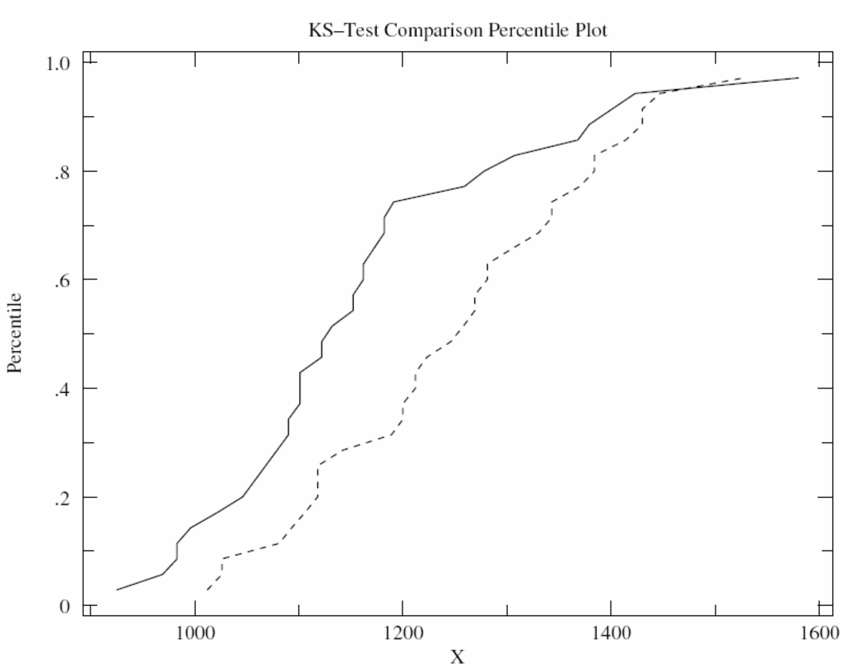
Items in Data Set 2: 2005

1.012 1.026 1.026 1.081 1.093 1.106 1.118 1.118 1.118 1.142 1.189 1.200 1.200 1.212 1.212 1.223 1.246 1.258 1.269 1.269 1.281 1.281 1.305 1.330 1.343 1.343 1.370 1.384 1.384 1.414 1.430 1.430 1.447 1.527

Appendix S
(continued)

School D - OVERALL IEP RESULTS





The maximum difference between the cumulative distributions, *D*, is: 0.1795 with a corresponding *P* of: 0.652

2004

IEP
Scaled Score 1157

Advanced	0	0%	
Proficient	5	15%	15%
Basic	5	15%	
Below Basic	23	70%	85%
Total	33	.	

2005

IEP
Scaled Score 1246

Advanced	2	6%	
Proficient	10	29%	35%
Basic	13	38%	
Below Basic	9	26%	65%
Total	34		

Appendix T

School A -Teacher/Group Level Assessment Score Comparison: 2004 -2005

School A – Teacher 1 – Overall RESULTS

Data Set A: 2004

- 80 data points were entered
- Mean = 1.520
- 95% confidence interval for actual Mean: 1480. thru 1560.
- Standard Deviation = 180.
- High = 1.983 Low = 1.142
- Third Quartile = 1.642 First Quartile = 1.382
- Median = 1.545
- Average Absolute Deviation from Median = 144.

Data Set B: 2005

- 97 data points were entered
- Mean = 1.522
- 95% confidence interval for actual Mean: 1494. thru 1550.
- Standard Deviation = 139.
- High = 2.016 Low = 1.235
- Third Quartile = 1.610 First Quartile = 1.422
- Median = 1.527
- Average Absolute Deviation from Median = 111.

Kolmogorov-Smirnov Comparison of Two Data Sets

The maximum difference between the cumulative distributions, *D*, is: 0.1344 with a corresponding *P* of: 0.381

Appendix T
(continued)

School A – Teacher 1 – Overall RESULTS

Items in Data Set 1: 2004

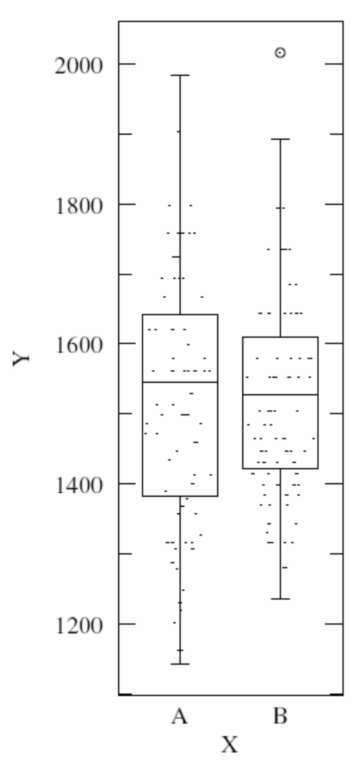
1.142 1.162 1.162 1.201 1.220 1.230 1.249 1.278 1.288 1.307 1.307 1.317 1.317 1.317
1.317 1.327 1.358 1.358 1.368 1.379 1.390 1.401 1.412 1.412 1.435 1.447 1.460 1.460
1.472 1.472 1.486 1.486 1.499 1.499 1.499 1.499 1.514 1.514 1.529 1.545 1.545 1.545
1.562 1.562 1.562 1.562 1.562 1.562 1.562 1.562 1.580 1.580 1.599 1.620 1.620 1.620
1.620 1.642 1.642 1.642 1.642 1.642 1.667 1.667 1.694 1.694 1.694 1.694 1.724 1.724
1.724 1.758 1.758 1.758 1.758 1.758 1.798 1.798 1.903 1.983

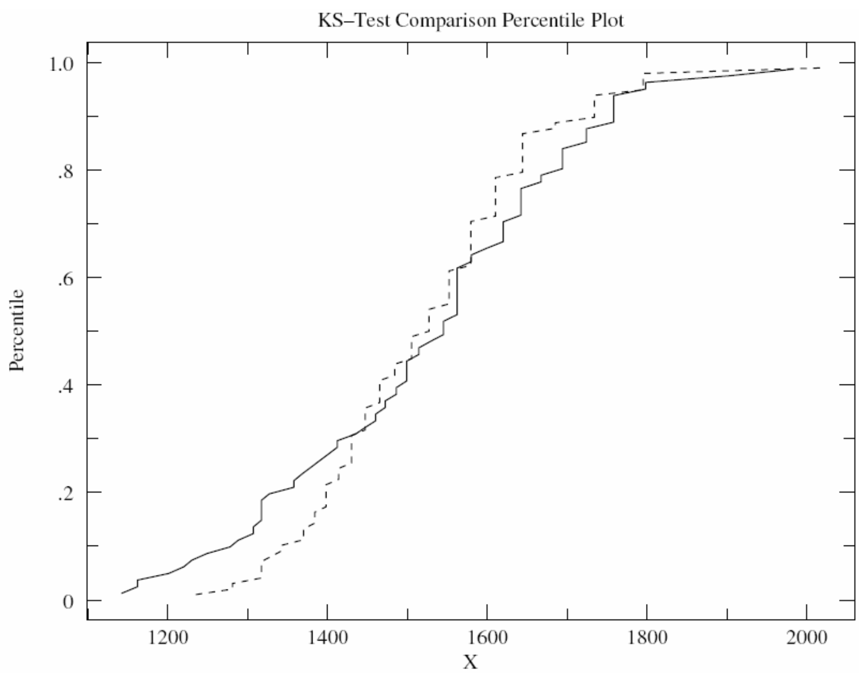
Items in Data Set 2: 2005

1.235 1.281 1.281 1.317 1.317 1.317 1.317 1.330 1.343 1.343 1.370 1.370 1.370 1.384
1.384 1.384 1.398 1.398 1.398 1.398 1.398 1.414 1.414 1.414 1.430 1.430 1.430 1.430
1.430 1.430 1.447 1.447 1.447 1.447 1.447 1.465 1.465 1.465 1.465 1.465 1.484 1.484
1.484 1.505 1.505 1.505 1.505 1.505 1.527 1.527 1.527 1.527 1.527 1.552 1.552 1.552
1.552 1.552 1.552 1.552 1.579 1.579 1.579 1.579 1.579 1.579 1.579 1.579 1.579 1.610
1.610 1.610 1.610 1.610 1.610 1.610 1.610 1.644 1.644 1.644 1.644 1.644 1.644 1.644
1.644 1.685 1.685 1.734 1.734 1.734 1.734 1.734 1.795 1.795 1.795 1.795 2.016

Appendix T
(continued)

School A – Teacher 1 – Overall RESULTS





The maximum difference between the cumulative distributions, *D*, is: 0.1344 with a corresponding *P* of: 0.381

TEACHER 1 2004

OVERALL
Scaled Score 1520

Advanced	43	54%	
Proficient	28	35%	89%
Basic	6	8%	
Below Basic	3	4%	12%
Total	80		

TEACHER 1 2005

OVERALL
Scaled Score 1522

Advanced	67	69%	
Proficient	27	29%	97%
Basic	3	3%	
Below Basic	0	0%	3%
Total	97		

Appendix T
(continued)

School A – Teacher 1 – Non-Accelerated RESULTS – Student Group 1

Data Set A: 2004

- 28 data points were entered
- Mean = 1.406
- 95% confidence interval for actual Mean: 1348. thru 1463.
- Standard Deviation = 149.
- High = 1.642 Low = 1.142
- Third Quartile = 1.541 First Quartile = 1.293
- Median = 1.396
- Average Absolute Deviation from Median = 125.

Data Set B: 2005

- 57 data points were entered
- Mean = 1.474
- 95% confidence interval for actual Mean: 1443. thru 1505.
- Standard Deviation = 116.
- High = 1.795 Low = 1.235
- Third Quartile = 1.552 First Quartile = 1.391
- Median = 1.465
- Average Absolute Deviation from Median = 95.2

Kolmogorov-Smirnov Comparison of Two Data Sets

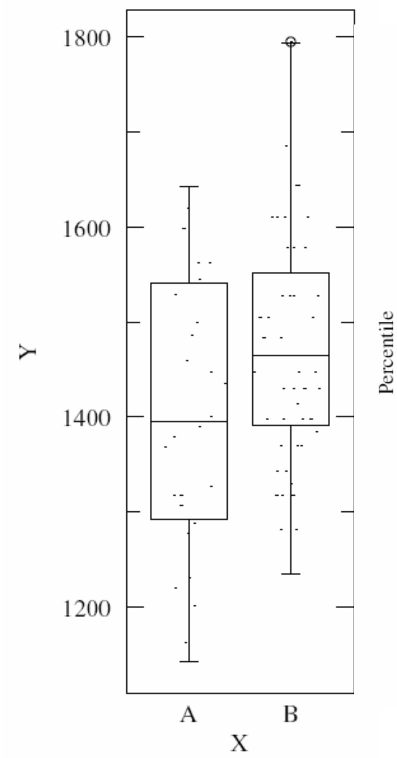
The maximum difference between the cumulative distributions, *D*, is: 0.2701 with a corresponding *P* of: 0.107

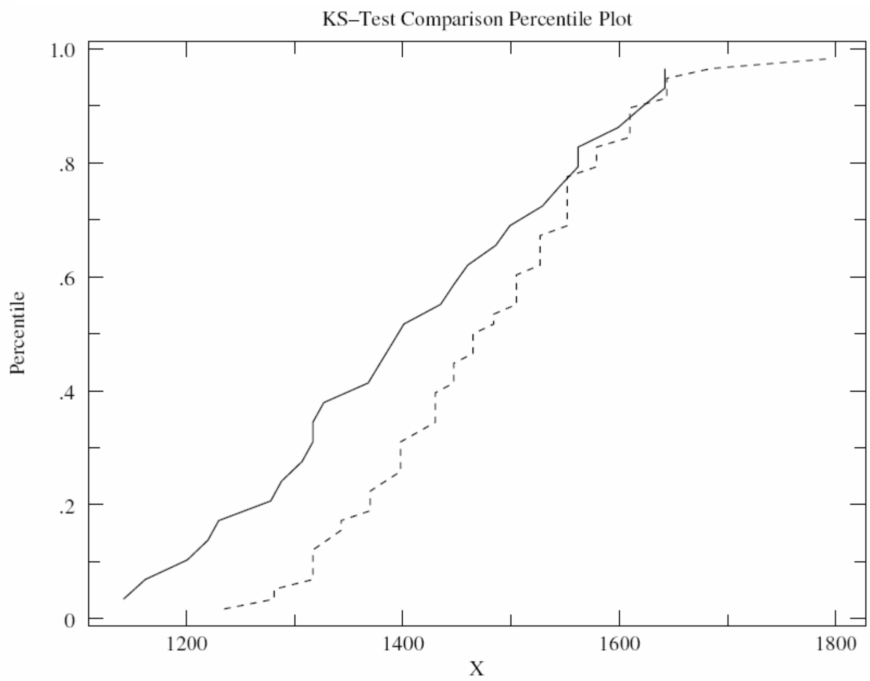
Items in Data Set 1: 2004
1.142 1.162 1.201 1.220 1.230 1.278 1.288 1.307 1.317 1.317 1.327 1.368 1.379 1.390 1.401 1.435 1.447 1.460 1.486 1.499 1.529 1.545 1.562 1.562 1.599 1.620 1.642 1.642

Items in Data Set 2: 2005
1.235 1.281 1.281 1.317 1.317 1.317 1.317 1.330 1.343 1.343 1.370 1.370 1.370 1.384 1.398 1.398 1.398 1.398 1.414 1.430 1.430 1.430 1.430 1.447 1.447 1.447 1.465 1.465 1.465 1.484 1.484 1.505 1.505 1.505 1.505 1.527 1.527 1.527 1.527 1.552 1.552 1.552 1.552 1.552 1.552 1.579 1.579 1.579 1.610 1.610 1.610 1.610 1.644 1.644 1.644 1.685 1.795

Appendix T
(continued)

School A – Teacher 1 – Non-Accelerated RESULTS – Student Group 1





The maximum difference between the cumulative distributions, *D*, is: 0.2701 with a corresponding *P* of: 0.107

2004

NON-ACCELERATED

Scaled Score 1405

Advanced	8	28%	
Proficient	13	46%	75%
Basic	5	18%	
Below Basic	2	7%	25%
Total	28		

2005

NON-ACCELERATED

Scaled Score 1474

Advanced	34	60%	
Proficient	20	35%	95%
Basic	3	5%	
Below Basic	0	0%	5%
Total	57		

Appendix T
(continued)

School A – Teacher 2 – Overall RESULTS

Data Set A: 2004

- 54 data points were entered
- Mean = 1.458
- 95% confidence interval for actual Mean: 1429. thru 1487.
- Standard Deviation = 107.
- High = 1.694 Low = 1.191
- Third Quartile = 1.529 First Quartile = 1.376
- Median = 1.447

Data Set B: 2005

- 50 data points were entered
- Mean = 1.563
- 95% confidence interval for actual Mean: 1518. thru 1607.
- Standard Deviation = 158.
- High = 2.016 Low = 1.293
- Third Quartile = 1.644 First Quartile = 1.447
- Median = 1.552

Kolmogorov-Smirnov Comparison of Two Data Sets

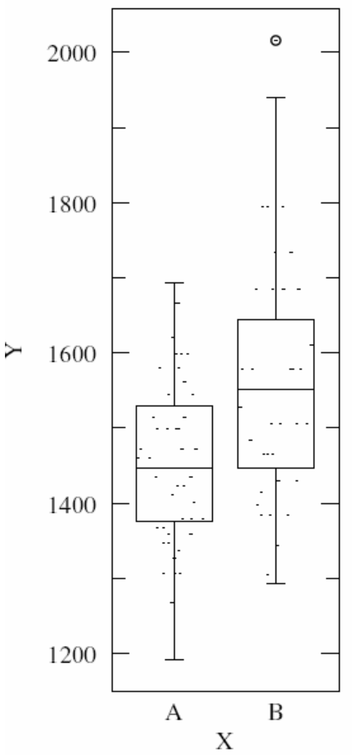
The maximum difference between the cumulative distributions, *D*, is: 0.3548 with a corresponding *P* of: 0.002

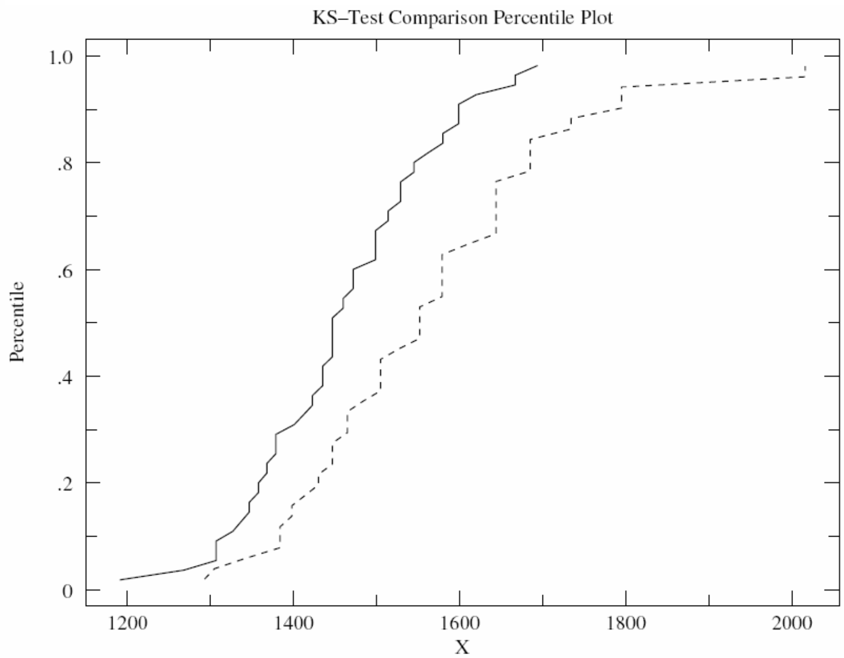
Items in Data Set 1:
1.191 1.268 1.307 1.307 1.307 1.327 1.337 1.347 1.347 1.358 1.358 1.368 1.368 1.379 1.379 1.379 1.401 1.412 1.423 1.423 1.435 1.435 1.435 1.447 1.447 1.447 1.447 1.447 1.460 1.460 1.472 1.472 1.472 1.499 1.499 1.499 1.499 1.514 1.514 1.529 1.529 1.529 1.545 1.545 1.562 1.580 1.580 1.599 1.599 1.599 1.620 1.667 1.667 1.694

Items in Data Set 2:
1.293 1.305 1.343 1.384 1.384 1.384 1.398 1.398 1.414 1.430 1.430 1.447 1.447 1.447 1.465 1.465 1.465 1.484 1.505 1.505 1.505 1.505 1.527 1.552 1.552 1.552 1.552 1.579 1.579 1.579 1.579 1.579 1.610 1.644 1.644 1.644 1.644 1.644 1.644 1.685 1.685 1.685 1.685 1.734 1.734 1.795 1.795 1.795 2.016 2.016

Appendix T
(continued)

School A – Teacher 2 – Overall RESULTS ** Population Shift **





The maximum difference between the cumulative distributions, *D*, is: 0.3548 with a corresponding *P* of: 0.002

TEACHER 2 2004

OVERALL
Scaled Score 1453

Advanced	17	31%	
Proficient	35	64%	94%
Basic	2	4%	
Below Basic	1	2%	6%
Total	55		

TEACHER 2 2005

OVERALL
Scaled Score 1563

Advanced	39	78%	
Proficient	11	22%	100%
Basic	0	0%	
Below Basic	0	0%	
Total	50		

Appendix T
(continued)

School A – Teacher 2 – Non-Accelerated RESULTS - Student Group 2

Data Set A: 2004

- 54 data points were entered
- Mean = 1.458
- 95% confidence interval for actual Mean: 1429. thru 1487.
- Standard Deviation = 107.
- High = 1.694 Low = 1.191
- Third Quartile = 1.529 First Quartile = 1.376
- Median = 1.447
- Average Absolute Deviation from Median = 84.7

Data Set B: 2005

- 26 data points were entered
- Mean = 1.487
- 95% confidence interval for actual Mean: 1446. thru 1528.
- Standard Deviation = 102.
- High = 1.795 Low = 1.305
- Third Quartile = 1.552 First Quartile = 1.410
- Median = 1.475
- Average Absolute Deviation from Median = 75.6

Kolmogorov-Smirnov Comparison of Two Data Sets

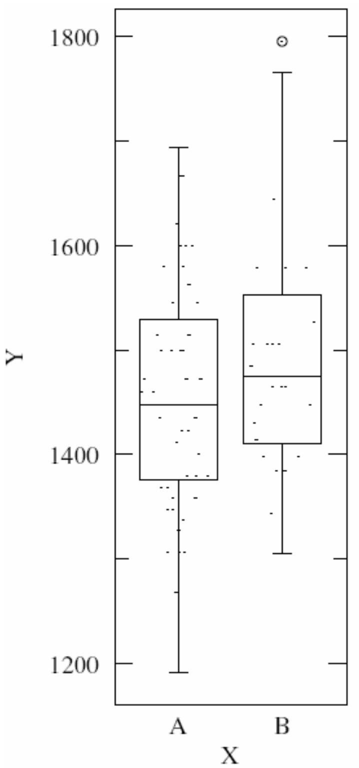
The maximum difference between the cumulative distributions, *D*, is: 0.2194 with a corresponding *P* of: 0.326

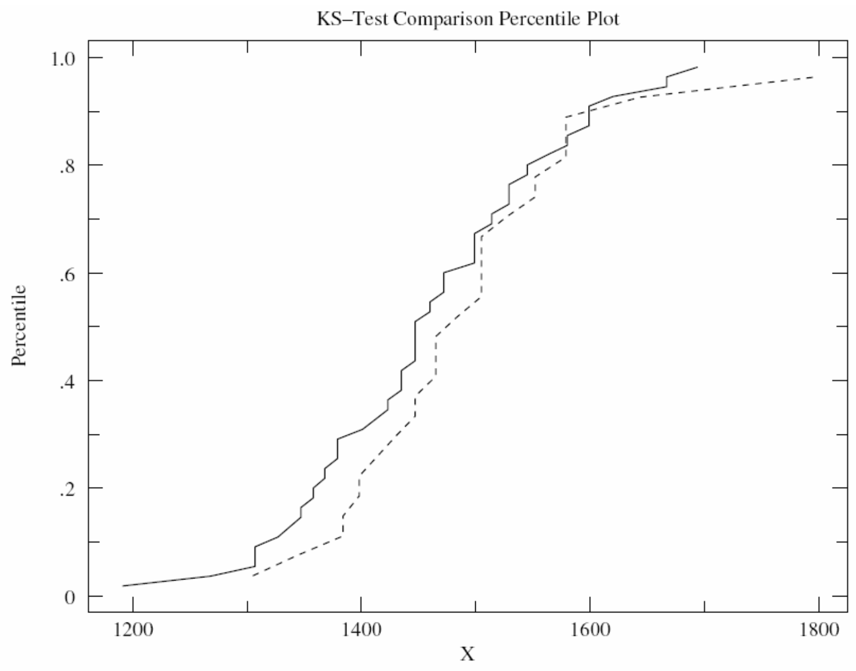
Items in Data Set 1: 2004
1.191 1.268 1.307 1.307 1.307 1.327 1.337 1.347 1.347 1.358 1.358 1.368 1.368 1.379 1.379 1.379 1.401 1.412 1.423 1.423 1.435 1.435 1.435 1.447 1.447 1.447 1.447 1.447 1.460 1.460 1.472 1.472 1.472 1.499 1.499 1.499 1.499 1.514 1.514 1.529 1.529 1.529 1.545 1.545 1.562 1.580 1.580 1.599 1.599 1.599 1.620 1.667 1.667 1.694

Items in Data Set 2: 2005
1.305 1.343 1.384 1.384 1.398 1.398 1.414 1.430 1.447 1.447 1.465 1.465 1.465 1.484 1.505 1.505 1.505 1.505 1.527 1.552 1.552 1.579 1.579 1.579 1.644 1.795

Appendix T
(continued)

School A – Teacher 2 – Non-Accelerated RESULTS – Student Group 2





The maximum difference between the cumulative distributions, *D*, is: 0.2194 with a corresponding *P* of: 0.326

2004

NON-ACCELERATED

Scaled Score 1453

Advanced	17	31%	
Proficient	35	64%	94%
Basic	2	4%	
Below Basic	1	2%	6%
Total	55		

2005

NON-ACCELERATED

Scaled Score 1487

Advanced	18	69%	
Proficient	8	31%	100%
Basic	0	0%	
Below Basic	0	0%	
Total	26		

Appendix T
(continued)

School A – Teacher 3 – Overall RESULTS – Student Group 3

Data Set A: 2004

- 15 data points were entered
- Mean = 1.367
- 95% confidence interval for actual Mean: 1284. thru 1451.
- Standard Deviation = 150.
- High = 1.642 Low = 1.101
- Third Quartile = 1.435 First Quartile = 1.259
- Median = 1.368
- Average Absolute Deviation from Median = 113.

Data Set B: 2005

- 25 data points were entered
- Mean = 1.359
- 95% confidence interval for actual Mean: 1311. thru 1408.
- Standard Deviation = 117.
- High = 1.610 Low = 1.118
- Third Quartile = 1.439 First Quartile = 1.287
- Median = 1.356
- Average Absolute Deviation from Median = 92.0

Kolmogorov-Smirnov Comparison of Two Data Sets

The maximum difference between the cumulative distributions, *D*, is: 0.1333 with a corresponding *P* of: 0.993

Items in Data Set 1: 2004

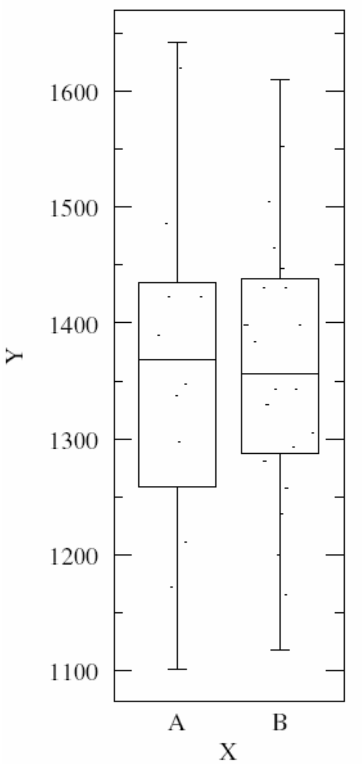
1.101 1.172 1.211 1.259 1.297 1.337 1.347 1.368 1.390 1.423 1.423 1.435 1.486 1.620 1.642

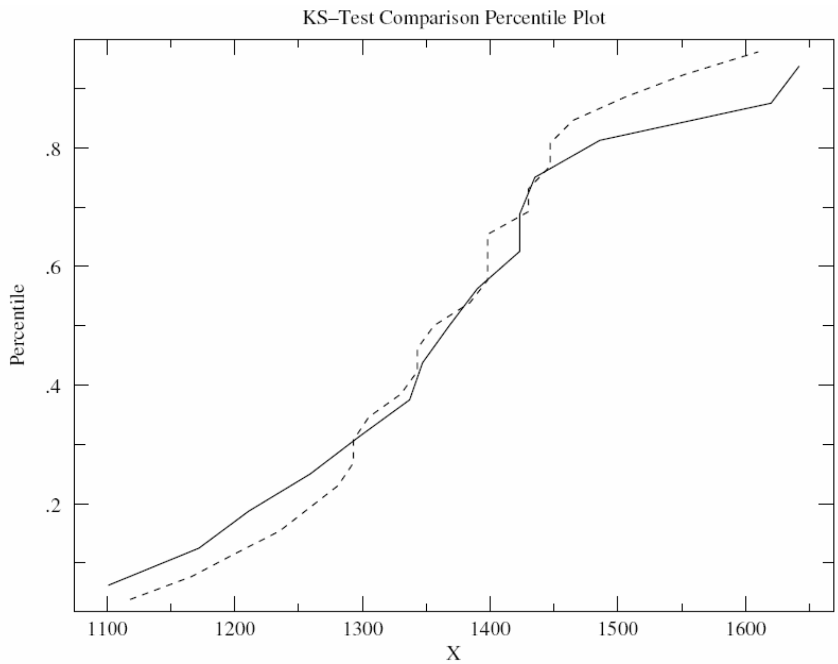
Items in Data Set 2: 2005

1.118 1.166 1.200 1.235 1.258 1.281 1.293 1.293 1.305 1.330 1.343 1.343 1.356 1.384 1.398 1.398 1.398 1.430 1.430 1.447 1.447 1.465 1.505 1.552 1.610

Appendix T
(continued)

School A – Teacher 3 – Overall RESULTS – Student Group 3





The maximum difference between the cumulative distributions, *D*, is: 0.1333 with a corresponding *P* of: 0.993

TEACHER 3 2004

OVERALL
Scaled Score 1368

Advanced	2	13%	
Proficient	9	60%	73%
Basic	3	20%	
Below Basic	1	7%	27%
Total	15		

TEACHER 3 2005

OVERALL
Scaled Score 1359

Advanced	6	24%	
Proficient	13	52%	76%
Basic	4	16%	
Below Basic	2	8%	24%
Total	25		

Appendix U

School B -Teacher/Group Level Assessment Score Comparison: 2004 -2005

School B – Teacher 5 – Overall RESULTS

Data Set A: 2004

- 88 data points were entered
- Mean = 1.477
- 95% confidence interval for actual Mean: 1439. thru 1515.
- Standard Deviation = 179.
- High = 1.903 Low = 1.057
- Third Quartile = 1.637 First Quartile = 1.327
- Median = 1.466
- Average Absolute Deviation from Median = 147.

Data Set B: 2005

- 108 data points were entered
- Mean = 1.490
- 95% confidence interval for actual Mean: 1458. thru 1523.
- Standard Deviation = 172.
- High = 2.240 Low = 1.142
- Third Quartile = 1.579 First Quartile = 1.370
- Median = 1.484
- Average Absolute Deviation from Median = 129.

Kolmogorov-Smirnov Comparison of Two Data Sets

The maximum difference between the cumulative distributions, *D*, is: 0.1595 with a corresponding *P* of: 0.154

Appendix U
(continued)

School B – Teacher 5 – Overall RESULTS

Items in Data Set 1: 2004

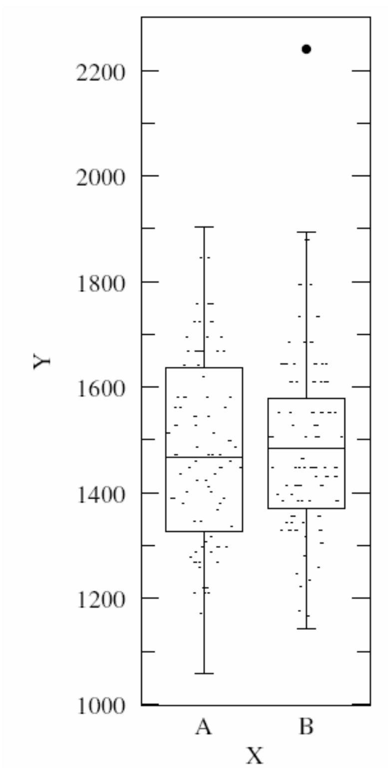
1.057 1.172 1.211 1.211 1.211 1.220 1.220 1.259 1.268 1.268 1.268 1.278 1.288 1.288
1.297 1.297 1.297 1.297 1.307 1.317 1.327 1.327 1.327 1.337 1.347 1.347 1.368 1.379
1.379 1.390 1.390 1.390 1.401 1.401 1.412 1.423 1.423 1.435 1.435 1.447 1.447 1.447
1.460 1.460 1.472 1.472 1.472 1.472 1.472 1.486 1.486 1.499 1.514 1.514 1.529 1.529
1.545 1.545 1.562 1.562 1.562 1.580 1.580 1.580 1.580 1.620 1.642 1.642 1.667 1.667
1.667 1.667 1.667 1.667 1.667 1.694 1.694 1.694 1.724 1.724 1.724 1.724 1.758 1.758
1.758 1.845 1.845 1.903

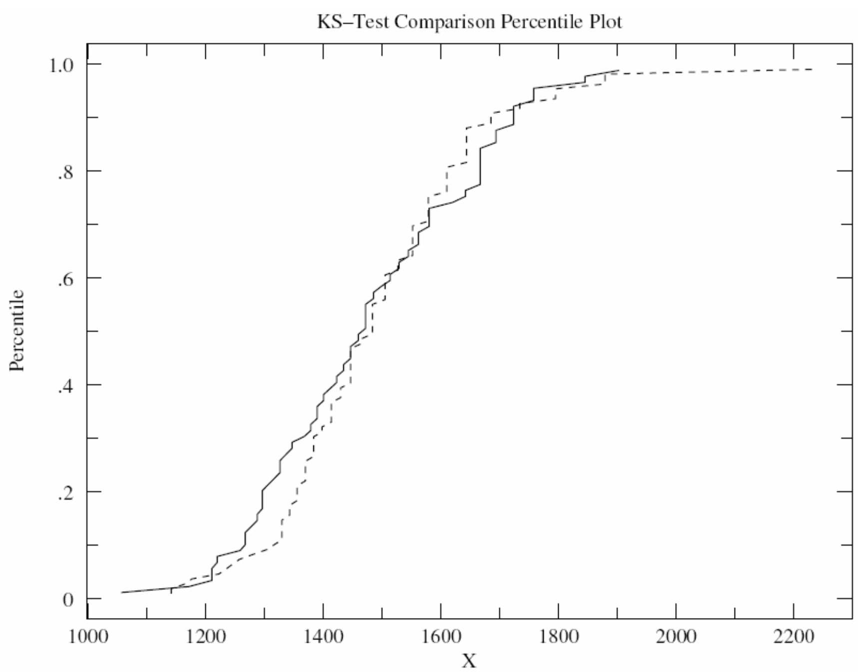
Items in Data Set 2: 2005

1.142 1.142 1.166 1.177 1.223 1.235 1.246 1.258 1.281 1.305 1.317 1.330 1.330 1.330
1.330 1.330 1.343 1.343 1.343 1.356 1.356 1.356 1.356 1.370 1.370 1.370 1.370 1.370
1.384 1.384 1.384 1.384 1.384 1.398 1.398 1.414 1.414 1.414 1.414 1.414 1.430 1.430
1.430 1.447 1.447 1.447 1.447 1.447 1.447 1.447 1.447 1.465 1.465 1.484 1.484 1.484
1.484 1.484 1.484 1.484 1.505 1.505 1.505 1.505 1.505 1.505 1.527 1.527 1.527 1.552
1.552 1.552 1.552 1.552 1.552 1.552 1.579 1.579 1.579 1.579 1.579 1.579 1.610 1.610
1.610 1.610 1.610 1.610 1.644 1.644 1.644 1.644 1.644 1.644 1.644 1.644 1.685 1.685
1.685 1.734 1.734 1.795 1.795 1.795 1.879 1.879 1.879 2.240

Appendix U
(continued)

School B – Teacher 5 – Overall RESULTS





The maximum difference between the cumulative distributions, *D*, is: 0.1595 with a corresponding *P* of: 0.154

TEACHER 5 2004

OVERALL
Scaled Score 1477

Advanced	36	41%
Proficient	34	39%
Basic	16	18%
Below Basic	2	2%

Total 88

TEACHER 5 2005

OVERALL
Scaled Score 1490

Advanced	65	60%	
Proficient	34	31%	91%
Basic	6	6%	
Below Basic	3	3%	9%

Total 108

Appendix U
(continued)

School B – Teacher 5 – Non-Accelerated RESULTS – Student Group 6

Data Set A: 2004

- 53 data points were entered
- Mean = 1.428
- 95% confidence interval for actual Mean: 1389. thru 1467.
- Standard Deviation = 141.
- High = 1.845 Low = 1.057
- Third Quartile = 1.514 First Quartile = 1.327
- Median = 1.435
- Average Absolute Deviation from Median = 109.

Data Set B: 2005

- 62 data points were entered
- Mean = 1.446
- 95% confidence interval for actual Mean: 1415. thru 1477.
- Standard Deviation = 121.
- High = 1.879 Low = 1.142
- Third Quartile = 1.505 First Quartile = 1.370
- Median = 1.439
- Average Absolute Deviation from Median = 91.7

Kolmogorov-Smirnov Comparison of Two Data Sets

The maximum difference between the cumulative distributions, *D*, is: 0.1835 with a corresponding *P* of: 0.263

Appendix U
(continued)

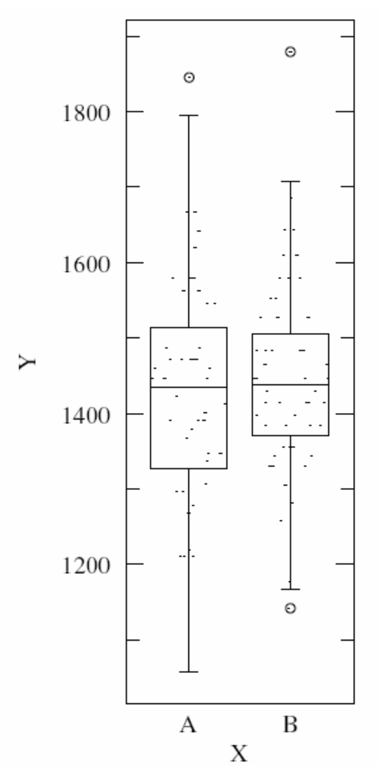
School B – Teacher 5 – Non-Accelerated RESULTS – Student Group 6

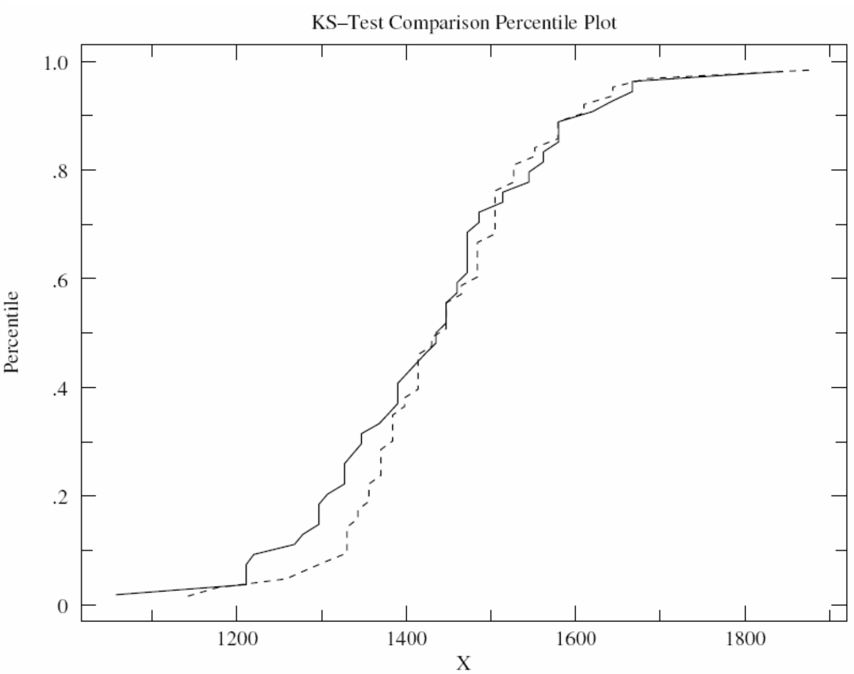
Items in Data Set 1: 2004
1.057 1.211 1.211 1.211 1.220 1.268 1.278 1.297 1.297 1.297 1.307 1.327 1.327 1.327 1.337 1.347 1.347 1.368 1.379 1.390 1.390 1.390 1.401 1.412 1.423 1.435 1.435 1.447 1.447 1.447 1.460 1.460 1.472 1.472 1.472 1.472 1.472 1.486 1.486 1.514 1.514 1.545 1.545 1.562 1.562 1.580 1.580 1.580 1.620 1.642 1.667 1.667 1.845

Items in Data Set 2: 2004
1.142 1.177 1.258 1.281 1.305 1.330 1.330 1.330 1.330 1.343 1.343 1.356 1.356 1.356 1.370 1.370 1.370 1.370 1.384 1.384 1.384 1.384 1.398 1.398 1.414 1.414 1.414 1.414 1.414 1.430 1.430 1.447 1.447 1.447 1.447 1.465 1.465 1.484 1.484 1.484 1.484 1.484 1.505 1.505 1.505 1.505 1.505 1.505 1.527 1.527 1.527 1.552 1.552 1.579 1.579 1.579 1.610 1.610 1.644 1.644 1.685 1.879

Appendix U
(continued)

School B – Teacher 5 – Non-Accelerated RESULTS – Student Group 6





The maximum difference between the cumulative distributions, *D*, is: 0.1835 with a corresponding *P* of: 0.263

2004

NON-ACCELERATED

Scaled Score 1428

Advanced	14	26%	
Proficient	29	55%	81%
Basic	9	17%	
Below Basic	1	2%	19%
Total	53		

2005

NON-ACCELERATED

Scaled Score 1446

Advanced	31	50%	
Proficient	27	44%	94%
Basic	3	5%	
Below Basic	1	2%	6%
Total	62		

Appendix U
(continued)

School B – Teacher 5 – IEP RESULTS – Student Group 6

Data Set A: 2004

- 11 data points were entered
- Mean = 1.316
- 95% confidence interval for actual Mean: 1223. thru 1408.
- Standard Deviation = 138.
- High = 1.694 Low = 1.172
- Third Quartile = 1.317 First Quartile = 1.259
- Median = 1.288
- Average Absolute Deviation from Median = 73.6

Data Set B: 2005

- 14 data points were entered
- Mean = 1.345
- 95% confidence interval for actual Mean: 1265. thru 1424.
- Standard Deviation = 138.
- High = 1.644 Low = 1.142
- Third Quartile = 1.447 First Quartile = 1.232
- Median = 1.337
- Average Absolute Deviation from Median = 108.

Kolmogorov-Smirnov Comparison of Two Data Sets

The maximum difference between the cumulative distributions, *D*, is: 0.3896 with a corresponding *P* of: 0.238

Items in Data Set 1: 2004

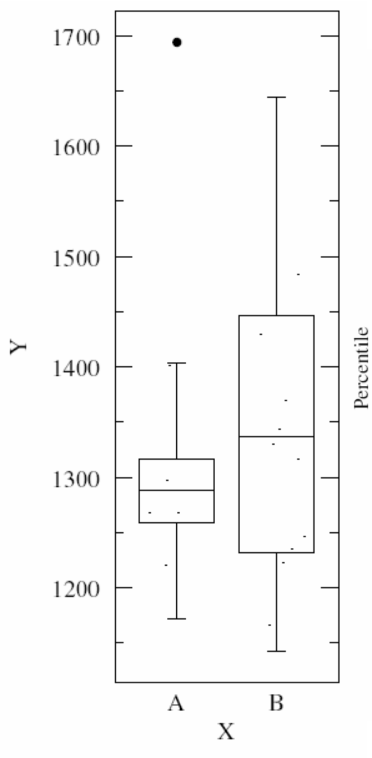
1.172 1.220 1.259 1.268 1.268 1.288 1.288 1.297 1.317 1.401 1.694

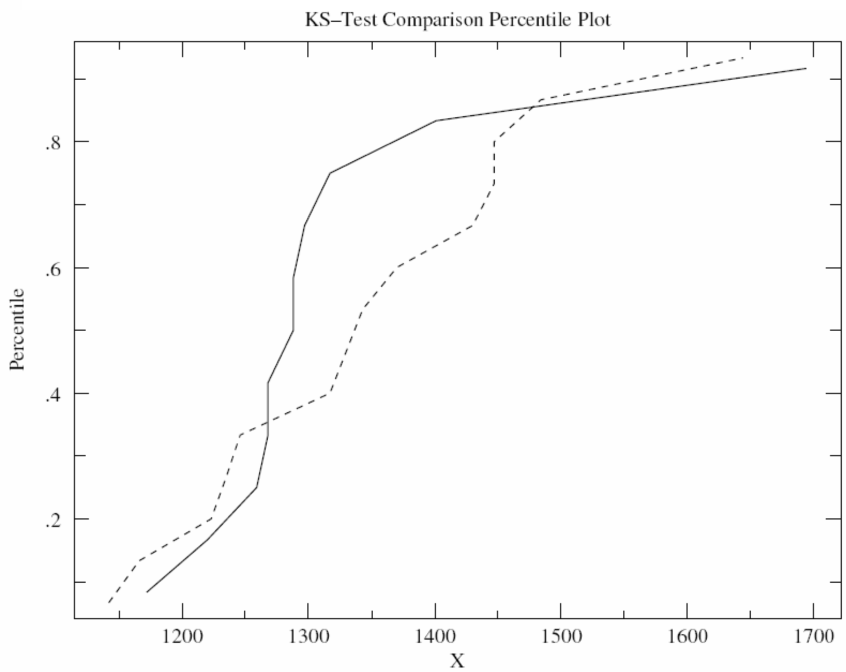
Items in Data Set 2: 2005

1.142 1.166 1.223 1.235 1.246 1.317 1.330 1.343 1.370 1.430 1.447 1.447 1.484 1.644

Appendix U
(continued)

School B – Teacher 5 – IEP RESULTS – Student Group 6





The maximum difference between the cumulative distributions, *D*, is: 0.3896 with a corresponding *P* of: 0.238

2004

IEP

Scaled Score 1316

Advanced	1	9%	
Proficient	2	18%	27%
Basic	7	64%	
Below Basic	1	9%	73%
Total	11		

2005

IEP

Scaled Score 1345

Advanced	4	29%	
Proficient	5	36%	64%
Basic	3	21%	
Below Basic	2	14%	36%
Total	14		

Appendix U
(continued)

School B – Teacher 6 – Overall RESULTS

Data Set A: 2004

- 87 data points were entered
- Mean = 1.458
- 95% confidence interval for actual Mean: 1423. thru 1493.
- Standard Deviation = 165.
- High = 1.798 Low = 1.022
- Third Quartile = 1.545 First Quartile = 1.347
- Median = 1.423
- Average Absolute Deviation from Median = 128.

Data Set B: 2005

- 100 data points were entered
- Mean = 1.473
- 95% confidence interval for actual Mean: 1437. thru 1509.
- Standard Deviation = 182.
- High = 2.016 Low = 981.
- Third Quartile = 1.579 First Quartile = 1.384
- Median = 1.505
- Average Absolute Deviation from Median = 131.

Kolmogorov-Smirnov Comparison of Two Data Sets

The maximum difference between the cumulative distributions, *D*, is: 0.2177 with a corresponding *P* of: 0.020

Appendix U
(continued)

School B – Teacher 6 – Overall RESULTS

Items in Data Set 1: 2004

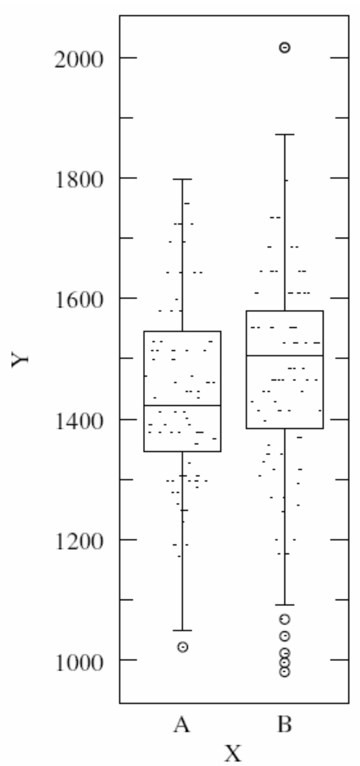
1.022 1.172 1.191 1.191 1.230 1.249 1.249 1.259 1.278 1.278 1.288 1.297 1.297 1.297 1.297 1.297 1.307 1.307 1.307 1.327 1.347 1.347 1.358 1.368 1.379 1.379 1.379 1.379 1.379 1.379 1.379 1.390 1.390 1.390 1.401 1.412 1.412 1.412 1.423 1.423 1.423 1.423 1.423 1.423 1.435 1.435 1.447 1.447 1.447 1.460 1.460 1.460 1.472 1.472 1.499 1.499 1.514 1.514 1.514 1.514 1.514 1.529 1.529 1.529 1.545 1.545 1.545 1.580 1.580 1.580 1.599 1.642 1.642 1.642 1.642 1.694 1.694 1.724 1.724 1.724 1.758 1.758 1.758 1.798 1.798 1.798 1.798

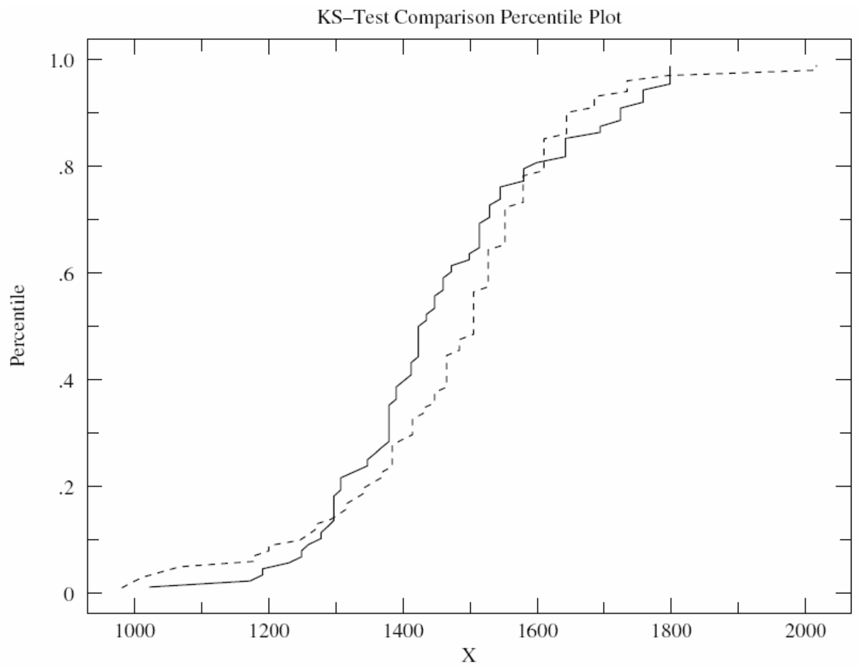
Items in Data Set 2: 2004

981. 996. 1.012 1.040 1.068 1.177 1.177 1.200 1.200 1.246 1.258 1.269 1.269 1.293 1.305 1.317 1.317 1.330 1.343 1.343 1.356 1.370 1.370 1.384 1.384 1.384 1.384 1.384 1.398 1.414 1.414 1.414 1.414 1.430 1.430 1.447 1.447 1.447 1.465 1.465 1.465 1.465 1.465 1.465 1.465 1.484 1.484 1.484 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.527 1.527 1.527 1.527 1.527 1.527 1.527 1.527 1.552 1.552 1.552 1.552 1.552 1.552 1.552 1.552 1.579 1.579 1.579 1.579 1.579 1.579 1.610 1.610 1.610 1.610 1.610 1.610 1.610 1.644 1.644 1.644 1.644 1.644 1.685 1.685 1.685 1.734 1.734 1.734 1.795 2.016 2.016

Appendix U
(continued)

School B – Teacher 6 – Overall RESULTS





The maximum difference between the cumulative distributions, *D*, is: 0.2177 with a corresponding *P* of: 0.020

TEACHER 6 2004

OVERALL
Scaled Score 1458

Advanced	31	36%	
Proficient	40	46%	82%
Basic	14	16%	
Below Basic	2	2%	18%
Total	87		

TEACHER 6 2005

OVERALL
Scaled Score 1475

Advanced	65	65%	
Proficient	22	22%	87%
Basic	8	8%	
Below Basic	5	5%	13%
Total	100		

Appendix U
(continued)

School B – Teacher 6 – Non-Accelerated RESULTS – Student Group 4

Data Set A: 2004

- 55 data points were entered
- Mean = 1.386
- 95% confidence interval for actual Mean: 1359. thru 1413.
- Standard Deviation = 101.
- High = 1.599 Low = 1.172
- Third Quartile = 1.447 First Quartile = 1.297
- Median = 1.390

Data Set B: 2005

- 62 data points were entered
- Mean = 1.403
- 95% confidence interval for actual Mean: 1361. thru 1445.
- Standard Deviation = 164.
- High = 1.734 Low = 981.
- Third Quartile = 1.527 First Quartile = 1.317
- Median = 1.447

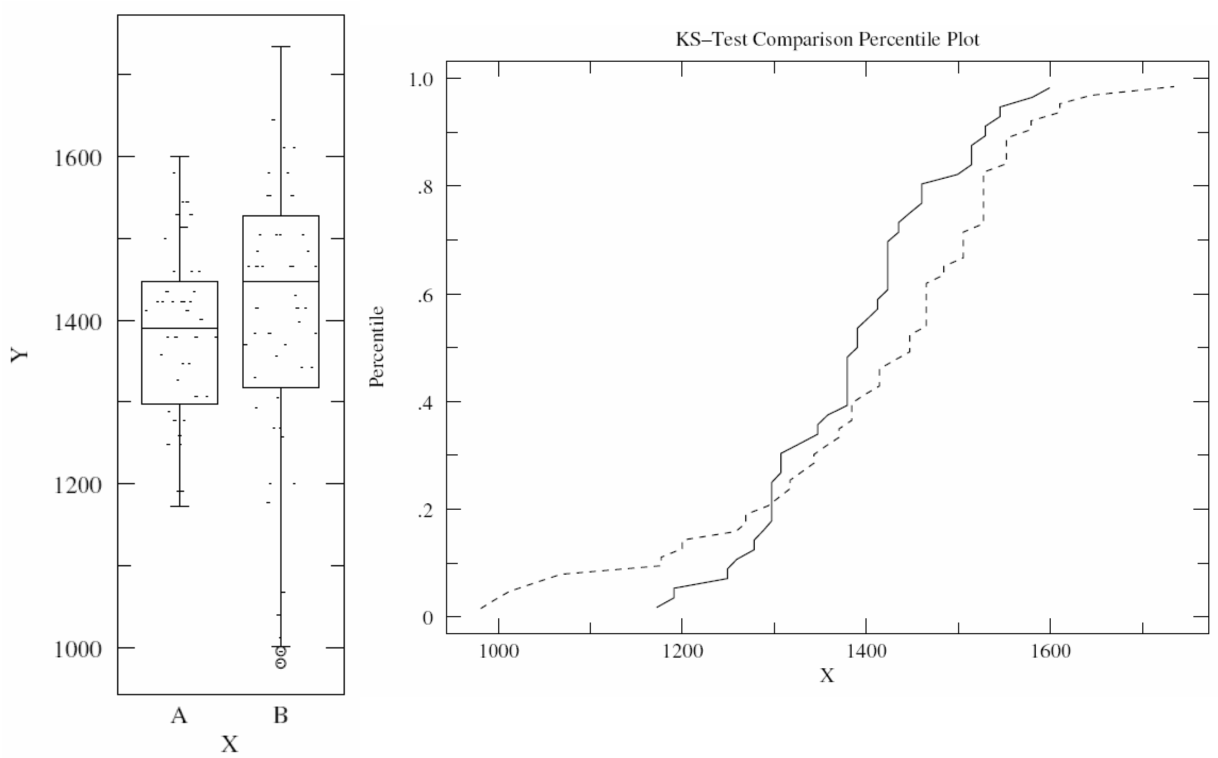
The maximum difference between the cumulative distributions, *D*, is: 0.2859 with a corresponding *P* of: 0.013

Items in Data Set 1: 2004
1.172 1.191 1.191 1.249 1.249 1.259 1.278 1.278 1.288 1.297 1.297 1.297 1.297 1.297
1.307 1.307 1.307 1.327 1.347 1.347 1.358 1.379 1.379 1.379 1.379 1.379 1.379 1.390
1.390 1.390 1.401 1.412 1.412 1.423 1.423 1.423 1.423 1.423 1.423 1.435 1.435 1.447
1.460 1.460 1.460 1.499 1.514 1.514 1.514 1.529 1.529 1.545 1.545 1.580 1.599

Items in Data Set 2: 2005
981. 996. 1.012 1.040 1.068 1.177 1.177 1.200 1.200 1.258 1.269 1.269 1.293 1.305
1.317 1.317 1.330 1.343 1.343 1.356 1.370 1.370 1.384 1.384 1.384 1.398 1.414 1.414
1.414 1.430 1.447 1.447 1.447 1.465 1.465 1.465 1.465 1.465 1.465 1.484 1.484 1.505
1.505 1.505 1.505 1.527 1.527 1.527 1.527 1.527 1.527 1.527 1.552 1.552 1.552 1.552
1.579 1.579 1.610 1.610 1.644 1.734

Appendix U
(continued)

School B – Teacher 6 – Non-Accelerated RESULTS – Student Group 4



The maximum difference between the cumulative distributions, *D*, is: 0.2859 with a corresponding *P* of: 0.013

2004

NON-ACCELERATED

Scaled Score 1386

Advanced	9	16%	
Proficient	32	58%	74%
Basic	13	24%	
Below Basic	1	2%	26%
Total	55		

2005

NON-ACCELERATED

Scaled Score 1400

Advanced	32	52%	
Proficient	18	29%	81%
Basic	7	11%	
Below Basic	5	8%	19%
Total	62		

Appendix U
(continued)

School B – Teacher 7 – Overall RESULTS

Data Set A: 2004

- 46 data points were entered
- Mean = 1.478
- 95% confidence interval for actual Mean: 1427. thru 1530.
- Standard Deviation = 173.
- High = 1.983 Low = 1.162
- Third Quartile = 1.580 First Quartile = 1.368
- Median = 1.460

Data Set B: 2005

- 58 data points were entered
- Mean = 1.479
- 95% confidence interval for actual Mean: 1426. thru 1533.
- Standard Deviation = 203.
- High = 2.016 Low = 1.093
- Third Quartile = 1.644 First Quartile = 1.302
- Median = 1.475

Kolmogorov-Smirnov Comparison of Two Data Sets

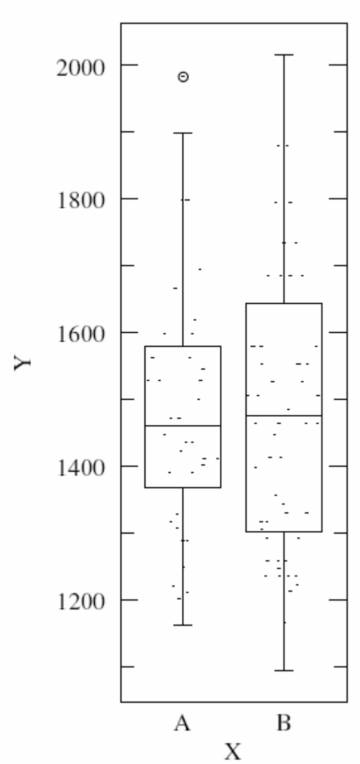
The maximum difference between the cumulative distributions, *D*, is: 0.1447 with a corresponding *P* of: 0.622

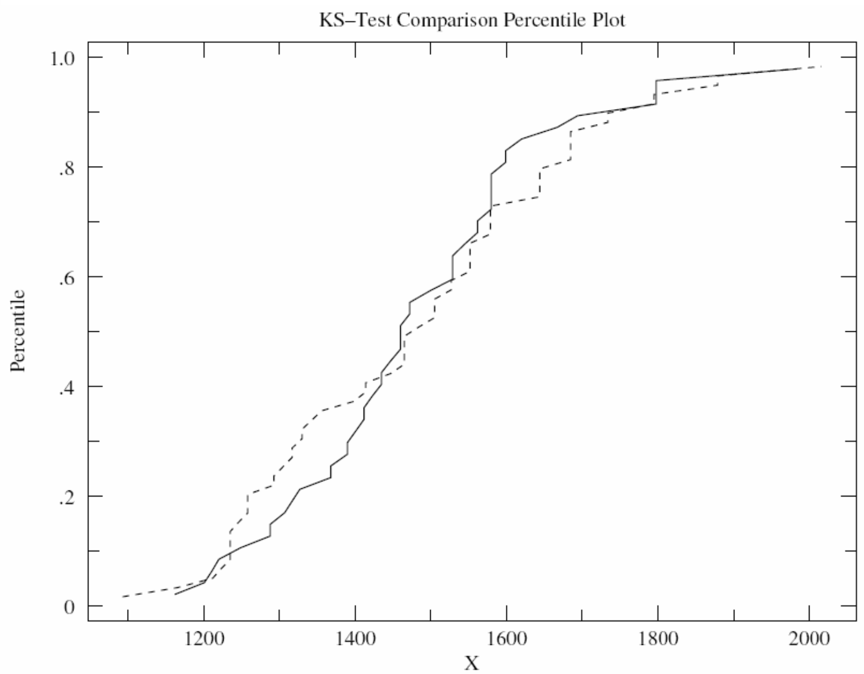
Items in Data Set 1: 2004
1.162 1.201 1.211 1.220 1.249 1.288 1.288 1.307 1.317 1.327 1.368 1.368 1.390 1.390 1.401 1.412 1.412 1.423 1.435 1.435 1.447 1.460 1.460 1.460 1.472 1.472 1.499 1.529 1.529 1.529 1.545 1.562 1.562 1.580 1.580 1.580 1.580 1.599 1.599 1.620 1.667 1.694 1.798 1.798 1.798 1.983

Items in Data Set 2: 2005
1.093 1.166 1.212 1.223 1.235 1.235 1.235 1.235 1.246 1.258 1.258 1.258 1.293 1.293 1.305 1.317 1.317 1.330 1.330 1.343 1.356 1.398 1.414 1.414 1.447 1.465 1.465 1.465 1.465 1.484 1.505 1.505 1.505 1.527 1.527 1.552 1.552 1.552 1.552 1.579 1.579 1.579 1.579 1.644 1.644 1.644 1.644 1.685 1.685 1.685 1.685 1.734 1.734 1.795 1.795 1.879 1.879 2.016

Appendix U
(continued)

School B – Teacher 7 – Overall RESULTS





The maximum difference between the cumulative distributions, *D*, is: 0.1447 with a corresponding *P* of: 0.622

TEACHER 7 2004

OVERALL
Scaled Score 1478

Advanced	19	41%	
Proficient	20	43%	85%
Basic	6	13%	
Below Basic	1	2%	15%
Total	46		

TEACHER 7 2005

OVERALL
Scaled Score 1480

Advanced	34	59%	
Proficient	12	21%	80%
Basic	10	17%	
Below Basic	2	3%	20%
Total	58		

Appendix U
(continued)

School B – Teacher 7 – Non-Accelerated RESULTS – Student Group 6

Data Set A: 2004

- 23 data points were entered
- Mean = 1.366
- 95% confidence interval for actual Mean: 1316. thru 1416.
- Standard Deviation = 116.
- High = 1.580 Low = 1.162
- Third Quartile = 1.447 First Quartile = 1.288
- Median = 1.368
- Average Absolute Deviation from Median = 94.4

Data Set B: 2005

- 31 data points were entered
- Mean = 1.333
- 95% confidence interval for actual Mean: 1289. thru 1377.
- Standard Deviation = 121.
- High = 1.644 Low = 1.093
- Third Quartile = 1.414 First Quartile = 1.235
- Median = 1.317
- Average Absolute Deviation from Median = 93.9

Kolmogorov-Smirnov Comparison of Two Data Sets

The maximum difference between the cumulative distributions, *D*, is: -0.2426 with a corresponding *P* of: 0.368

Items in Data Set 1: 2004

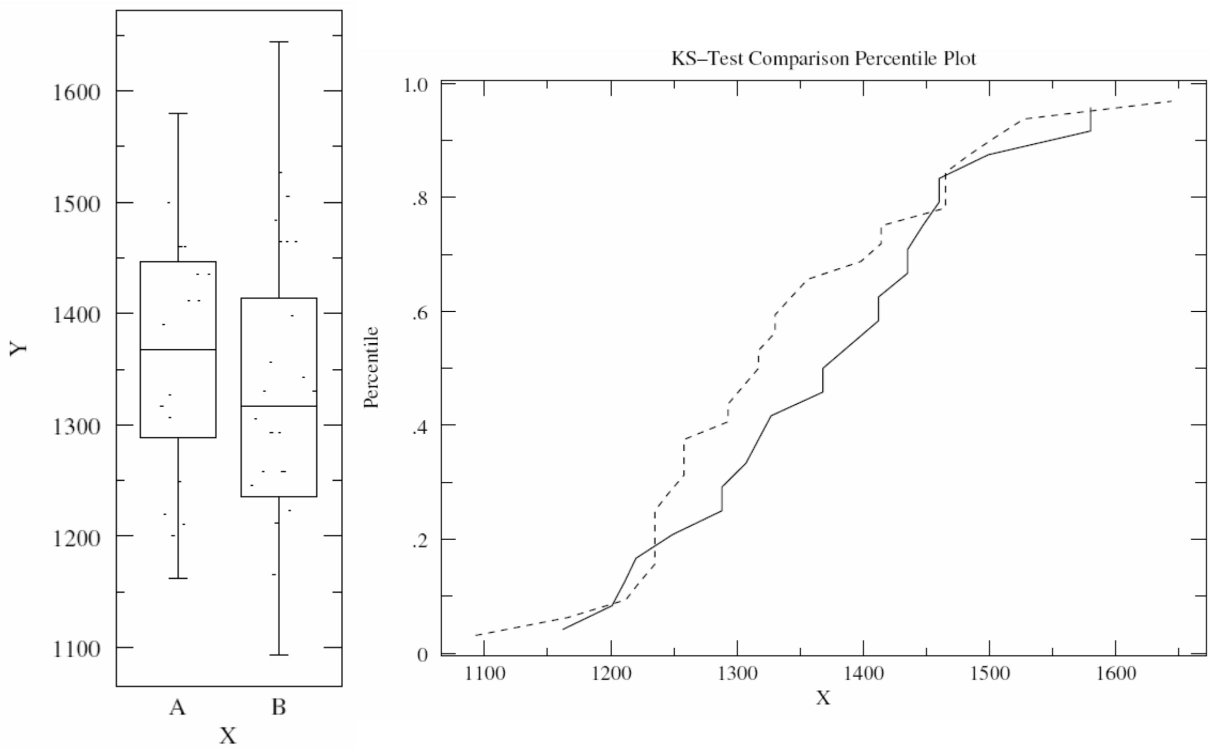
1.162 1.201 1.211 1.220 1.249 1.288 1.288 1.307 1.317 1.327 1.368 1.368 1.390 1.412 1.412 1.435 1.435 1.447 1.460 1.460 1.499 1.580 1.580

Items in Data Set 2: 2005

1.093 1.166 1.212 1.223 1.235 1.235 1.235 1.235 1.246 1.258 1.258 1.258 1.293 1.293 1.305 1.317 1.317 1.330 1.330 1.343 1.356 1.398 1.414 1.414 1.465 1.465 1.465 1.484 1.505 1.527 1.644

Appendix U
(continued)

School B – Teacher 7 – Non-Accelerated RESULTS – Student Group 6



The maximum difference between the cumulative distributions, *D*, is: -0.2426 with a corresponding *P* of: 0.368

2004

NON-ACCELERATED

Scaled Score 1366

Advanced	2	9%	
Proficient	14	61%	70%
Basic	6	26%	
Below Basic	1	4%	30%
Total	23		

2005

NON-ACCELERATED

Scaled Score 1332

Advanced	7	23%	
Proficient	12	39%	62%
Basic	10	32%	
Below Basic	2	6%	38%
Total	31		

Appendix U
(continued)

School B – Teacher 8 (IEP ONLY) – Overall RESULTS – Student Group 7

Data Set A: 2004

- 38 data points were entered
- Mean = 1.153
- 95% confidence interval for actual Mean: 1117. thru 1189.
- Standard Deviation = 110.
- High = 1.460 Low = 940.
- Third Quartile = 1.213 First Quartile = 1.087
- Median = 1.152
- Average Absolute Deviation from Median = 81.9

Data Set B: 2005

- 28 data points were entered
- Mean = 1.237
- 95% confidence interval for actual Mean: 1191. thru 1283.
- Standard Deviation = 119.
- High = 1.414 Low = 964.
- Third Quartile = 1.337 First Quartile = 1.142
- Median = 1.264
- Average Absolute Deviation from Median = 95.7

Kolmogorov-Smirnov Comparison of Two Data Sets

The maximum difference between the cumulative distributions, *D*, is: 0.4492 with a corresponding *P* of: 0.002

Items in Data Set 1: 2004

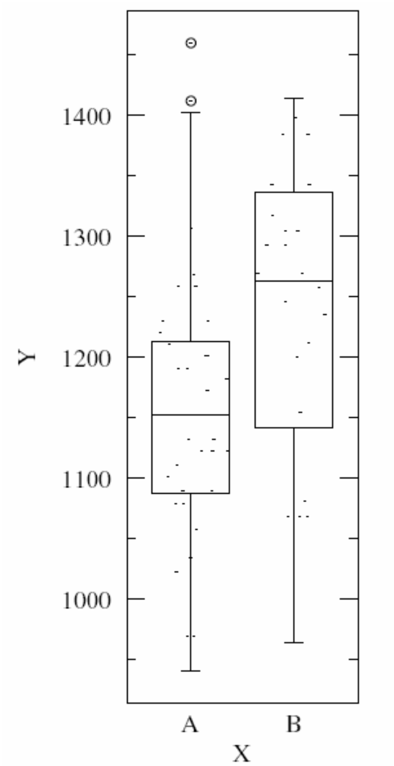
940. 969. 969. 1.022 1.034 1.034 1.057 1.079 1.079 1.090 1.090 1.101 1.111 1.122 1.122 1.122 1.132 1.132 1.152 1.152 1.152 1.172 1.172 1.182 1.191 1.191 1.201 1.201 1.211 1.220 1.230 1.230 1.259 1.259 1.268 1.307 1.412 1.460

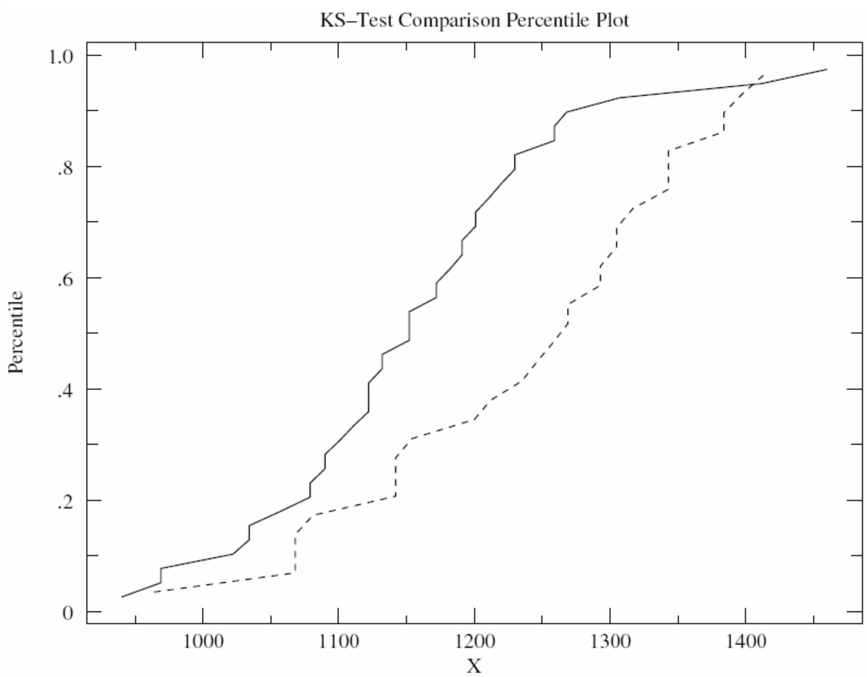
Items in Data Set 2: 2005

964. 1.068 1.068 1.068 1.081 1.142 1.142 1.142 1.154 1.200 1.212 1.235 1.246 1.258 1.269 1.269 1.293 1.293 1.305 1.305 1.317 1.343 1.343 1.343 1.384 1.384 1.398 1.414

Appendix U
(continued)

School B – Teacher 8 (IEP ONLY) – Overall RESULTS – Student Group 7





The maximum difference between the cumulative distributions, *D*, is: 0.4492 with a corresponding *P* of: 0.002

2004

IEP

Scaled Score 1156

Advanced	0	0%	
Proficient	4	11%	11%
Basic	11	29%	
Below Basic	23	61%	89%
Total	38		

2005

IEP

Scaled Score 1237

Advanced	0	0%	
Proficient	12	43%	43%
Basic	7	25%	
Below Basic	9	32%	57%
Total	28		

Appendix V

School C -Teacher/Group Level Assessment Score Comparison: 2004 -2005

School C – Teacher 9 – Overall RESULTS

Data Set A: 2004

- 80 data points were entered
- Mean = 1.398
- 95% confidence interval for actual Mean: 1356. thru 1441.
- Standard Deviation = 189.
- High = 1.845 Low = 1.009
- Third Quartile = 1.541 First Quartile = 1.278
- Median = 1.379
- Average Absolute Deviation from Median = 148.

Data Set B: 2005

- 101 data points were entered
- Mean = 1.572
- 95% confidence interval for actual Mean: 1538. thru 1605.
- Standard Deviation = 168.
- High = 2.016 Low = 1.154
- Third Quartile = 1.685 First Quartile = 1.465
- Median = 1.552
- Average Absolute Deviation from Median = 135.

Kolmogorov-Smirnov Comparison of Two Data Sets

The maximum difference between the cumulative distributions, *D*, is: 0.4473 with a corresponding *P* of: 0.000

Appendix V
(continued)

School C – Teacher 9 – Overall RESULTS

Items in Data Set 1: 2004

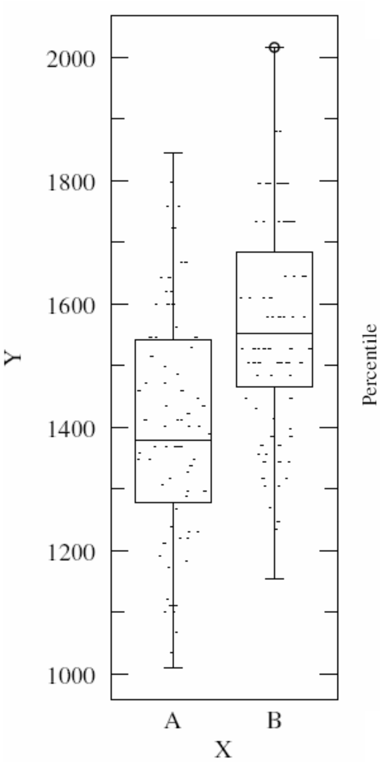
1.009 1.034 1.068 1.101 1.101 1.111 1.111 1.111 1.122 1.172 1.182 1.191 1.211 1.220
1.220 1.230 1.230 1.239 1.268 1.278 1.278 1.288 1.297 1.297 1.307 1.317 1.327 1.337
1.347 1.347 1.347 1.358 1.368 1.368 1.368 1.368 1.368 1.379 1.379 1.379 1.379 1.390
1.401 1.401 1.401 1.412 1.412 1.412 1.423 1.435 1.435 1.447 1.460 1.460 1.472 1.472
1.486 1.499 1.514 1.529 1.545 1.545 1.545 1.545 1.562 1.599 1.599 1.599 1.620 1.620
1.642 1.642 1.667 1.667 1.724 1.724 1.758 1.758 1.798 1.845

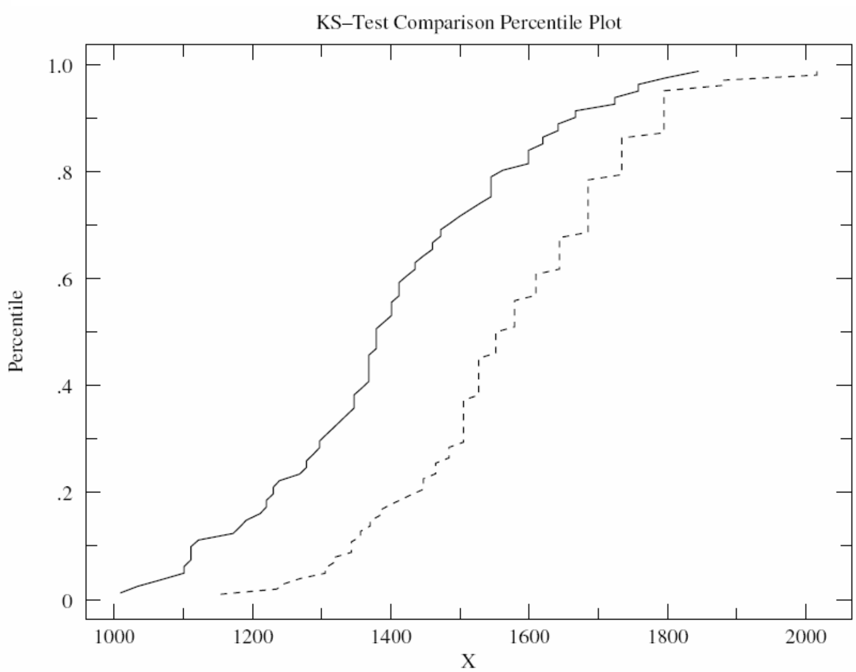
Items in Data Set 2: 2005

1.154 1.235 1.246 1.269 1.305 1.305 1.317 1.317 1.343 1.343 1.343 1.356 1.356 1.370
1.370 1.384 1.384 1.398 1.414 1.430 1.447 1.447 1.447 1.465 1.465 1.465 1.484 1.484
1.484 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.527 1.527 1.527 1.527
1.527 1.527 1.527 1.527 1.552 1.552 1.552 1.552 1.552 1.579 1.579 1.579 1.579 1.579
1.579 1.610 1.610 1.610 1.610 1.610 1.644 1.644 1.644 1.644 1.644 1.644 1.644 1.685
1.685 1.685 1.685 1.685 1.685 1.685 1.685 1.685 1.685 1.685 1.734 1.734 1.734 1.734
1.734 1.734 1.734 1.734 1.795 1.795 1.795 1.795 1.795 1.795 1.795 1.795 1.795 1.879
1.879 2.016 2.016

Appendix V
(continued)

School C – Teacher 9 – Overall RESULTS





The maximum difference between the cumulative distributions, *D*, is: 0.4473 with a corresponding *P* of: 0.000

TEACHER 9 2004

OVERALL
Scaled Score 1398

Advanced	22	27%	
Proficient	35	43%	70%
Basic	14	17%	
Below Basic	10	13%	30%
Total	81		

TEACHER 9 2005

OVERALL
Scaled Score 1556

Advanced	81	80%	
Proficient	15	15%	95%
Basic	4	4%	
Below Basic	1	1%	5%
Total	101		

Appendix V
(continued)

School C – Teacher 9 – Non-Accelerated RESULTS – Student Group 10

Data Set A: 2004

- 53 data points were entered
- Mean = 1.359
- 95% confidence interval for actual Mean: 1321. thru 1397.
- Standard Deviation = 138.
- High = 1.642 Low = 1.034
- Third Quartile = 1.441 First Quartile = 1.283
- Median = 1.368
- Average Absolute Deviation from Median = 104.

Data Set B: 2005

- 40 data points were entered
- Mean = 1.480
- 95% confidence interval for actual Mean: 1442. thru 1517.
- Standard Deviation = 117.
- High = 1.685 Low = 1.154
- Third Quartile = 1.552 First Quartile = 1.388
- Median = 1.505
- Average Absolute Deviation from Median = 89.5
- KS finds the data is consistent with a normal distribution: *P*= 0.47 where the normal distribution has mean= 1473. and sdev= 136.6
- KS finds the data is consistent with a log normal distribution: *P*= 0.30 where the log normal distribution has geometric mean= Inf and multiplicative sdev= Inf

Kolmogorov-Smirnov Comparison of Two Data Sets

The maximum difference between the cumulative distributions, *D*, is: 0.4302 with a corresponding *P* of: 0.000

Appendix V
(continued)

School C – Teacher 9 – Non-Accelerated RESULTS – Student Group 10

Items in Data Set 1: 2004

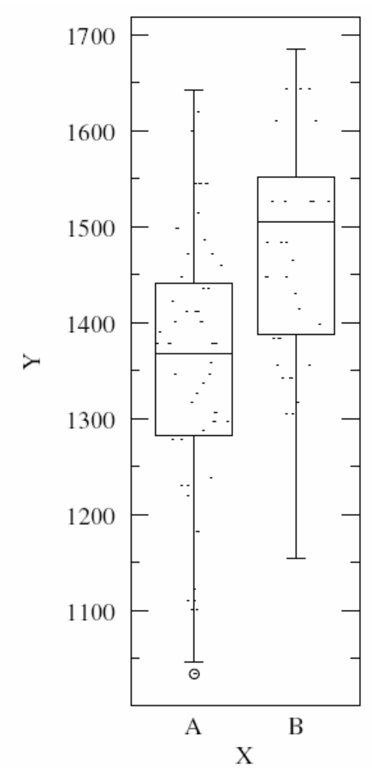
1.034 1.101 1.101 1.111 1.111 1.122 1.182 1.220 1.230 1.230 1.239 1.278 1.278 1.288
1.297 1.297 1.307 1.317 1.327 1.337 1.347 1.347 1.358 1.368 1.368 1.368 1.368 1.379
1.379 1.379 1.379 1.390 1.401 1.401 1.412 1.412 1.412 1.423 1.435 1.435 1.447 1.460
1.472 1.472 1.486 1.499 1.514 1.545 1.545 1.545 1.599 1.620 1.642

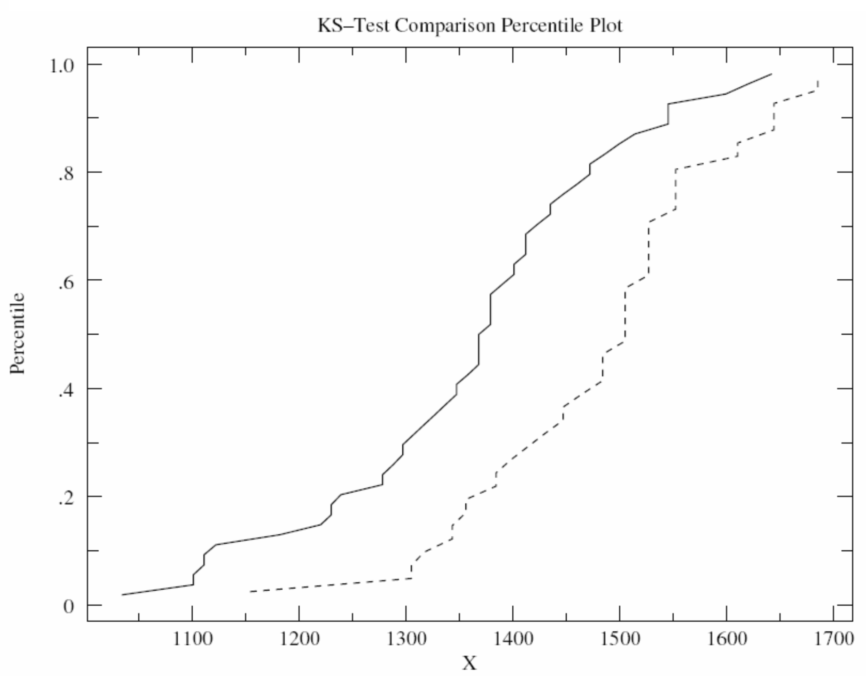
Items in Data Set 2: 2005

1.154 1.305 1.305 1.317 1.343 1.343 1.356 1.356 1.384 1.384 1.398 1.414 1.430 1.447
1.447 1.465 1.484 1.484 1.484 1.505 1.505 1.505 1.505 1.505 1.527 1.527 1.527 1.527
1.527 1.552 1.552 1.552 1.552 1.610 1.610 1.644 1.644 1.644 1.685 1.685

Appendix V
(continued)

School C – Teacher 9 – Non-Accelerated RESULTS – Student Group 10





The maximum difference between the cumulative distributions, *D*, is: 0.4302 with a corresponding *P* of: 0.000

2004

NON-ACCELERATED

Scaled Score 1358

Advanced	7	13%	
Proficient	30	57%	70%
Basic	10	19%	
Below Basic	6	11%	30%
Total	53		

2005

NON-ACCELERATED

Scaled Score 1477

Advanced	27	68%	
Proficient	12	30%	97%
Basic	0	0%	
Below Basic	1	3%	3%
Total	40		

Appendix V
(continued)

School C – Teacher 10 – Overall RESULTS   ** Populations Shift **

Data Set A: 2004

- 72 data points were entered
- Mean = 1.503
- 95% confidence interval for actual Mean: 1465. thru 1542.
- Standard Deviation = 165.
- High = 1.903 Low = 1.142
- Third Quartile = 1.615 First Quartile = 1.385
- Median = 1.514
- Average Absolute Deviation from Median = 132.

Data Set B: 2005

- 61 data points were entered
- Mean = 1.481
- 95% confidence interval for actual Mean: 1448. thru 1514.
- Standard Deviation = 129.
- High = 1.795 Low = 1.189
- Third Quartile = 1.552 First Quartile = 1.406
- Median = 1.484
- Average Absolute Deviation from Median = 95.4

Kolmogorov-Smirnov Comparison of Two Data Sets

The maximum difference between the cumulative distributions, D, is: 0.2136 with a corresponding P of: 0.085

Appendix V
(continued)

School C – Teacher 10 – Overall RESULTS

Items in Data Set 1: 2004

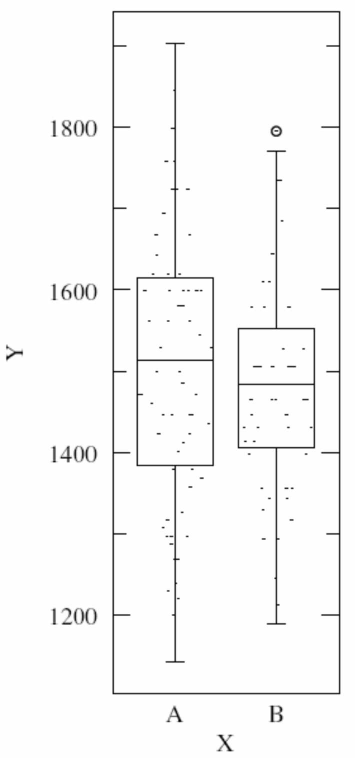
1.142 1.201 1.220 1.230 1.239 1.268 1.268 1.288 1.297 1.297 1.297 1.307 1.317 1.327
1.358 1.368 1.379 1.379 1.401 1.412 1.423 1.423 1.423 1.435 1.447 1.447 1.447 1.447
1.460 1.472 1.472 1.472 1.486 1.499 1.499 1.514 1.514 1.514 1.514 1.514 1.529 1.529
1.545 1.562 1.562 1.562 1.580 1.580 1.599 1.599 1.599 1.599 1.599 1.599 1.620 1.620
1.620 1.620 1.642 1.667 1.667 1.667 1.694 1.724 1.724 1.724 1.724 1.758 1.758 1.798
1.845 1.903

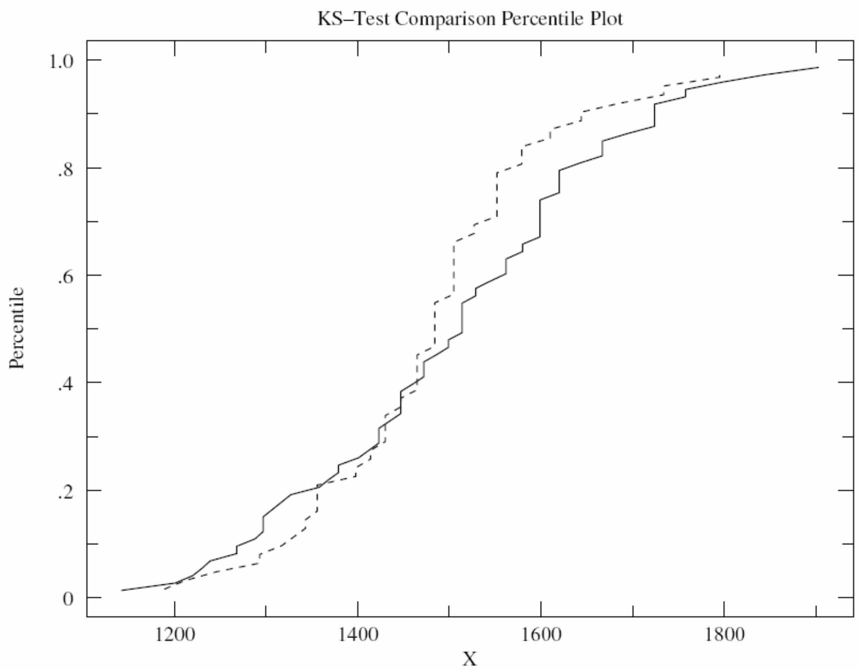
Items in Data Set 2: 2005

1.189 1.212 1.246 1.293 1.293 1.317 1.330 1.343 1.343 1.356 1.356 1.356 1.356 1.398
1.398 1.414 1.414 1.430 1.430 1.430 1.430 1.447 1.447 1.465 1.465 1.465 1.465 1.465
1.484 1.484 1.484 1.484 1.484 1.484 1.505 1.505 1.505 1.505 1.505 1.505 1.505 1.527
1.527 1.552 1.552 1.552 1.552 1.552 1.552 1.579 1.579 1.579 1.610 1.610 1.644 1.644
1.685 1.734 1.734 1.795 1.795

Appendix V
(continued)

School C – Teacher 10 – Overall RESULTS   ** Populations Shift **





The maximum difference between the cumulative distributions, *D*, is: 0.2136 with a corresponding *P* of: 0.085

TEACHER 10   2004

OVERALL
Scaled Score   1503

Advanced	38	53%
Proficient	23	32%
Basic	10	14%
Below Basic	1	1%
Total	72	

TEACHER 10   2005

OVERALL
Scaled Score   1481

Advanced	40	66%	
Proficient	18	30%	95%
Basic	3	5%	
Below Basic	0	0%	5%
Total	61		

Appendix V
(continued)

School C – Teacher 10 - Non-Accelerated RESULTS – Student Group 9
**** Teacher Change****

Data Set A: 2004

- 39 data points were entered
- Mean = 1.394
- 95% confidence interval for actual Mean: 1355. thru 1433.
- Standard Deviation = 121.
- High = 1.667 Low = 1.142
- Third Quartile = 1.472 First Quartile = 1.297
- Median = 1.412
- Average Absolute Deviation from Median = 97.4

Data Set B: 2005

- 52 data points were entered
- Mean = 1.491
- 95% confidence interval for actual Mean: 1455. thru 1528.
- Standard Deviation = 130.
- High = 1.795 Low = 1.212
- Third Quartile = 1.552 First Quartile = 1.414
- Median = 1.495
- Average Absolute Deviation from Median = 98.5

Kolmogorov-Smirnov Comparison of Two Data Sets

The maximum difference between the cumulative distributions, *D*, is: 0.3974 with a corresponding *P* of: 0.001

Appendix V
(continued)

School C – Teacher 10 - Non-Accelerated RESULTS - Student Group 9

Items in Data Set 1: 2004

1.142 1.201 1.220 1.230 1.239 1.268 1.268 1.288 1.297 1.297 1.297 1.307 1.317 1.327
1.358 1.368 1.379 1.379 1.401 1.412 1.423 1.423 1.423 1.435 1.447 1.447 1.447 1.447
1.460 1.472 1.472 1.499 1.514 1.514 1.529 1.562 1.580 1.620 1.667

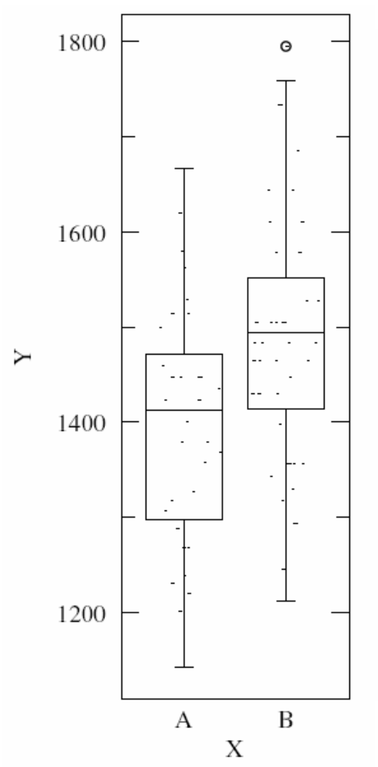
Items in Data Set 2: 2005

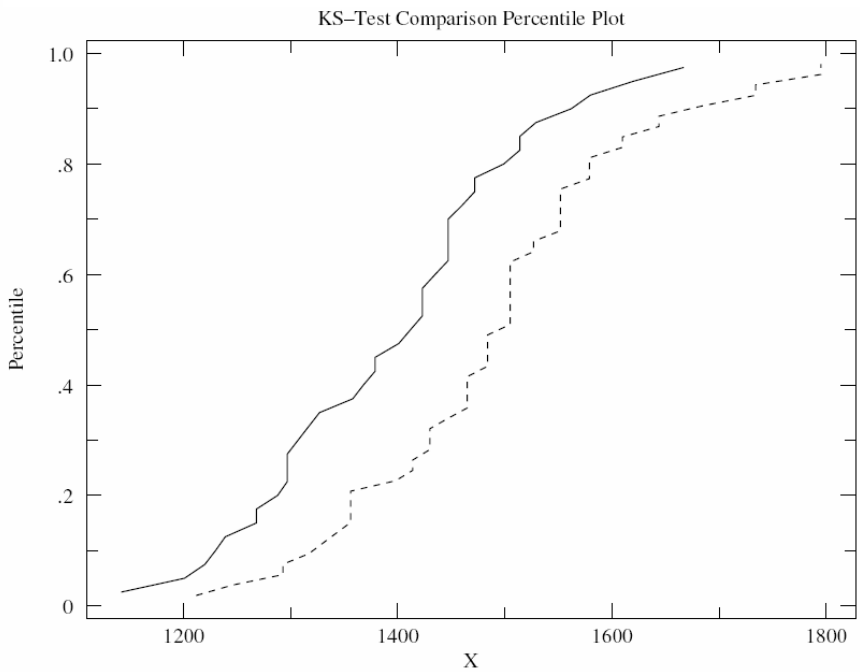
1.212 1.246 1.293 1.293 1.317 1.330 1.343 1.356 1.356 1.356 1.356 1.398 1.414 1.414
1.430 1.430 1.430 1.447 1.465 1.465 1.465 1.465 1.484 1.484 1.484 1.484 1.505 1.505
1.505 1.505 1.505 1.505 1.505 1.527 1.527 1.552 1.552 1.552 1.552 1.552 1.579 1.579
1.579 1.610 1.610 1.644 1.644 1.685 1.734 1.734 1.795 1.795

Appendix V
(continued)

School C – Teacher 10 - Non-Accelerated RESULTS - Student Group 9

**** Teacher Change****





The maximum difference between the cumulative distributions, *D*, is: 0.3974 with a corresponding *P* of: 0.001

2004

NON-ACCELERATED

Scaled Score 1394

Advanced	7	18%	
Proficient	21	54%	72%
Basic	10	26%	
Below Basic	1	3%	29%
Total	39		

2005

NON-ACCELERATED

Scaled Score 1491

Advanced	35	67%	
Proficient	15	29%	96%
Basic	2	4%	
Below Basic	0	0%	4%
Total	52		

Appendix V
(continued)

School C – Teacher 12 (IEP ONLY) – Overall RESULTS – Student Group 10

Data Set A: 2004

- 13 data points were entered
- Mean = 1.165
- 95% confidence interval for actual Mean: 1102. thru 1227.
- Standard Deviation = 103.
- High = 1.317 Low = 955.
- Third Quartile = 1.254 First Quartile = 1.101
- Median = 1.152
- Average Absolute Deviation from Median = 82.8

Data Set B: 2005

- 22 data points were entered
- Mean = 1.132
- 95% confidence interval for actual Mean: 1083. thru 1181.
- Standard Deviation = 111.
- High = 1.430 Low = 964.
- Third Quartile = 1.189 First Quartile = 1.040
- Median = 1.136
- Average Absolute Deviation from Median = 84.1

Kolmogorov-Smirnov Comparison of Two Data Sets

The maximum difference between the cumulative distributions, *D*, is: -0.2797 with a corresponding *P* of: 0.475

Items in Data Set 1: 2004

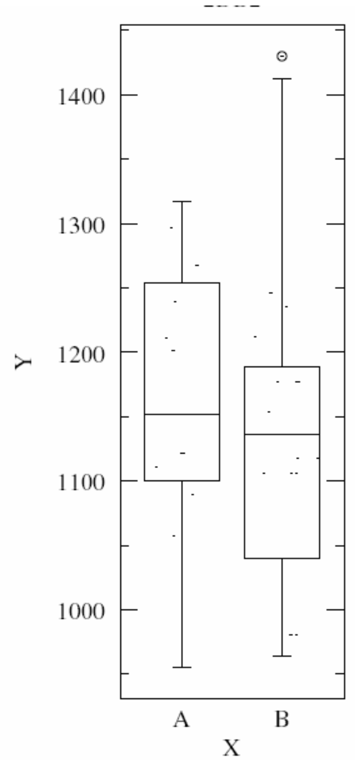
955. 1.057 1.090 1.111 1.122 1.122 1.152 1.201 1.211 1.239 1.268 1.297 1.317

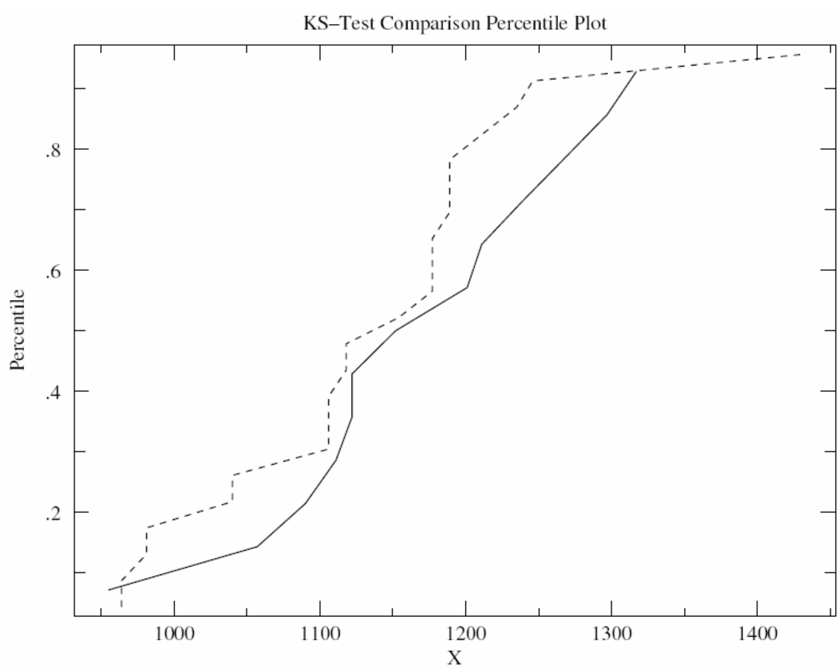
Items in Data Set 2: 2005

964. 964. 981. 981. 1.040 1.040 1.106 1.106 1.106 1.118 1.118 1.154 1.177 1.177 1.177 1.189 1.189 1.189 1.212 1.235 1.246 1.430

Appendix V
(continued)

School C – Teacher 12 (IEP ONLY) – Overall RESULTS –Student Group 10





The maximum difference between the cumulative distributions, *D*, is: -0.2797 with a corresponding *P* of: 0.475

2004

IEP

Scaled Score 1193

Advanced	1	8%	
Proficient	1	8%	16%
Basic	5	38%	
Below Basic	6	46%	84%
Total	13		

2005

IEP

Scaled Score 1131

Advanced	0	0%	
Proficient	1	5%	5%
Basic	9	41%	
Below Basic	12	55%	95%
Total	22		

Appendix W

School D -Teacher/Group Level Assessment Score Comparison: 2004 -2005

School D – Teacher 13 – Overall RESULTS

Data Set A: 2004

- 65 data points were entered
- Mean = 1.417
- 95% confidence interval for actual Mean: 1372. thru 1462.
- Standard Deviation = 182.
- High = 1.798 Low = 1.122
- Third Quartile = 1.562 First Quartile = 1.259
- Median = 1.447
- Average Absolute Deviation from Median = 155.

Data Set B: 2005

- 59 data points were entered
- Mean = 1.589
- 95% confidence interval for actual Mean: 1536. thru 1643.
- Standard Deviation = 205.
- High = 2.016 Low = 1.118
- Third Quartile = 1.685 First Quartile = 1.484
- Median = 1.579
- Average Absolute Deviation from Median = 152.

Kolmogorov-Smirnov Comparison of Two Data Sets

The results of a Kolmogorov-Smirnov test performed at 19:51 on 10-SEP-2005

The maximum difference between the cumulative distributions, *D*, is: 0.4070 with a corresponding *P* of: 0.000

Appendix W
(continued)

School D – Teacher 13 – Overall RESULTS

Items in Data Set 1: 2004

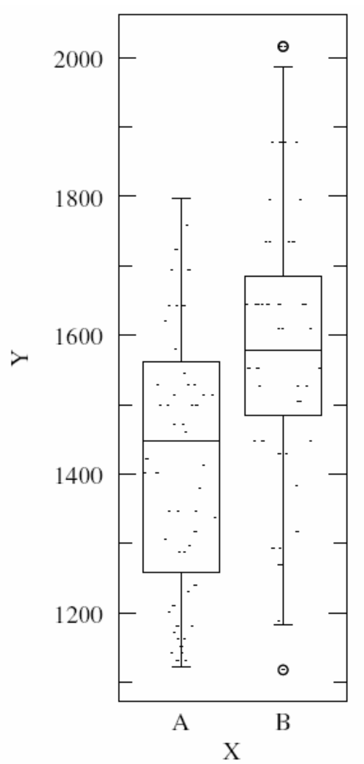
1.122 1.132 1.132 1.142 1.142 1.152 1.162 1.162 1.172 1.182 1.182 1.201 1.211 1.230
1.239 1.259 1.259 1.288 1.288 1.297 1.307 1.317 1.317 1.337 1.347 1.347 1.347 1.379
1.401 1.401 1.412 1.423 1.447 1.447 1.460 1.472 1.472 1.499 1.499 1.499 1.499 1.514
1.514 1.514 1.529 1.529 1.529 1.545 1.562 1.562 1.562 1.562 1.562 1.562 1.580 1.620
1.642 1.642 1.642 1.694 1.694 1.694 1.724 1.758 1.798

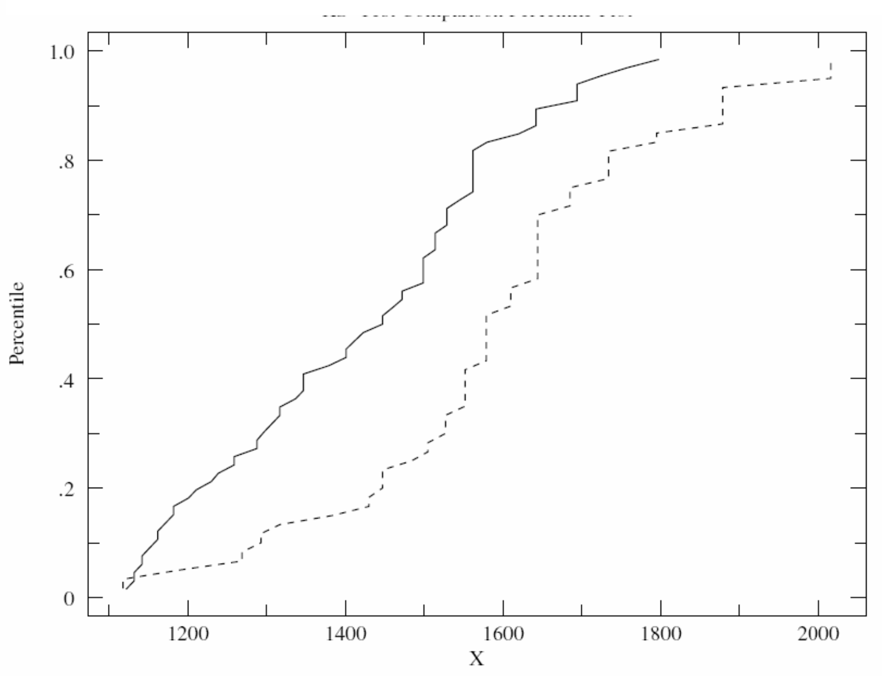
Items in Data Set 2: 2005

1.118 1.118 1.189 1.269 1.269 1.293 1.293 1.317 1.384 1.430 1.430 1.447 1.447 1.447
1.484 1.505 1.505 1.527 1.527 1.527 1.552 1.552 1.552 1.552 1.552 1.579 1.579 1.579
1.579 1.579 1.579 1.610 1.610 1.610 1.644 1.644 1.644 1.644 1.644 1.644 1.644 1.644
1.685 1.685 1.685 1.734 1.734 1.734 1.734 1.795 1.795 1.879 1.879 1.879 1.879 1.879
2.016 2.016 2.016

Appendix W
(continued)

School D – Teacher 13 – Overall RESULTS





The maximum difference between the cumulative distributions, *D*, is: 0.4070 with a corresponding *P* of: 0.000

TEACHER 13 2004

OVERALL
Scaled Score 1417

Advanced	24	37%	
Proficient	21	32%	69%
Basic	11	17%	
Below Basic	9	14%	31%
Total	65		

TEACHER 13 2005

OVERALL
Scaled Score 1583

Advanced	48	81%	
Proficient	6	10%	91%
Basic	3	5%	
Below Basic	2	3%	9%
Total	59		

Appendix W
(continued)

School D – Teacher 13 – Non-Accelerated RESULTS – Student Group 11

Data Set A: 2004

- 41 data points were entered
- Mean = 1.359
- 95% confidence interval for actual Mean: 1308. thru 1411.
- Standard Deviation = 163.
- High = 1.694 Low = 1.132
- Third Quartile = 1.499 First Quartile = 1.221
- Median = 1.337
- Average Absolute Deviation from Median = 134.

Data Set B: 2005

- 16 data points were entered
- Mean = 1.442
- 95% confidence interval for actual Mean: 1352. thru 1532.
- Standard Deviation = 169.
- High = 1.644 Low = 1.118
- Third Quartile = 1.572 First Quartile = 1.299
- Median = 1.495
- Average Absolute Deviation from Median = 129.

Kolmogorov-Smirnov Comparison of Two Data Sets

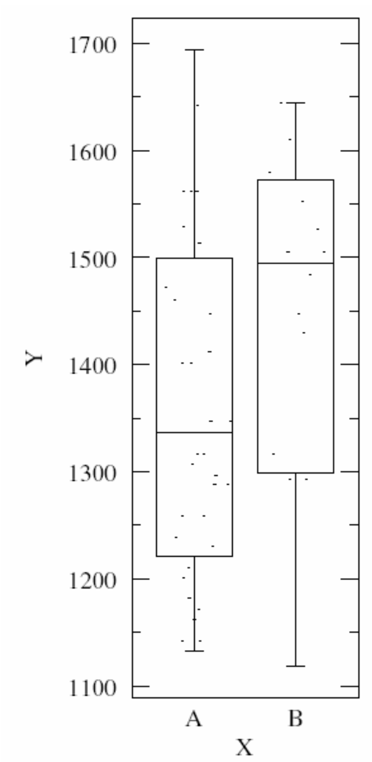
The maximum difference between the cumulative distributions, *D*, is: 0.3460 with a corresponding *P* of: 0.099

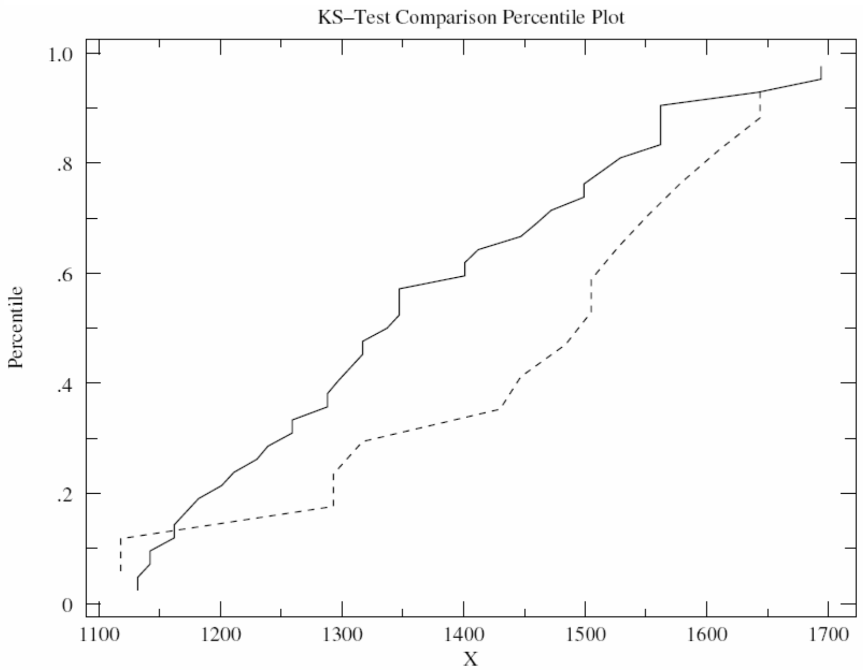
Items in Data Set 1: 2004
1.132 1.132 1.142 1.142 1.162 1.162 1.172 1.182 1.201 1.211 1.230 1.239 1.259 1.259 1.288 1.288 1.297 1.307 1.317 1.317 1.337 1.347 1.347 1.347 1.401 1.401 1.412 1.447 1.460 1.472 1.499 1.499 1.514 1.529 1.562 1.562 1.562 1.562 1.642 1.694 1.694

Items in Data Set 2: 2005
1.118 1.118 1.293 1.293 1.317 1.430 1.447 1.484 1.505 1.505 1.527 1.552 1.579 1.610 1.644 1.644

Appendix W
(continued)

School D – Teacher 13 – Non-Accelerated RESULTS – Student Group 11





The maximum difference between the cumulative distributions, *D*, is: 0.3460 with a corresponding *P* of: 0.099

2004

NON-ACCELERATED

Scaled Score 1359

Advanced	9	22%	
Proficient	15	37%	59%
Basic	10	24%	
Below Basic	7	17%	41%
Total	41		

2005

NON-ACCELERATED

Scaled Score 1442

Advanced	10	63%	
Proficient	4	25%	88%
Basic	0	0%	
Below Basic	2	12%	12%
Total	16		

Appendix W
(continued)

School D – Teacher 14 – Overall RESULTS

Data Set A: 2004

- 46 data points were entered
- Mean = 1.384
- 95% confidence interval for actual Mean: 1351. thru 1417.
- Standard Deviation = 111.
- High = 1.667 Low = 1.152
- Third Quartile = 1.463 First Quartile = 1.288
- Median = 1.390
- Average Absolute Deviation from Median = 88.1

Data Set B: 2005

- 78 data points were entered
- Mean = 1.423
- 95% confidence interval for actual Mean: 1393. thru 1453.
- Standard Deviation = 131.
- High = 1.685 Low = 1.012
- Third Quartile = 1.511 First Quartile = 1.330
- Median = 1.430
- Average Absolute Deviation from Median = 105.

Kolmogorov-Smirnov Comparison of Two Data Sets

The maximum difference between the cumulative distributions, *D*, is: 0.2302 with a corresponding *P* of: 0.079

Appendix W
(continued)

School D – Teacher 14 – Overall RESULTS

Items in Data Set 1: 2004

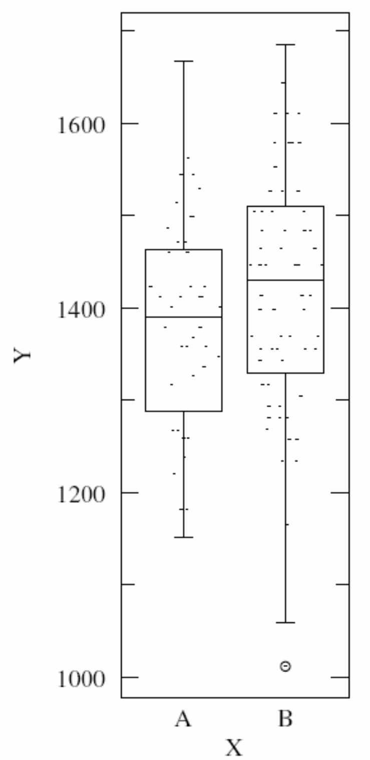
1.152 1.182 1.182 1.220 1.239 1.259 1.259 1.268 1.268 1.288 1.288 1.288 1.317 1.327 1.337 1.347 1.358 1.358 1.358 1.368 1.379 1.379 1.379 1.401 1.401 1.412 1.412 1.412 1.412 1.423 1.423 1.423 1.423 1.460 1.460 1.472 1.472 1.486 1.499 1.499 1.514 1.529 1.545 1.545 1.562 1.667

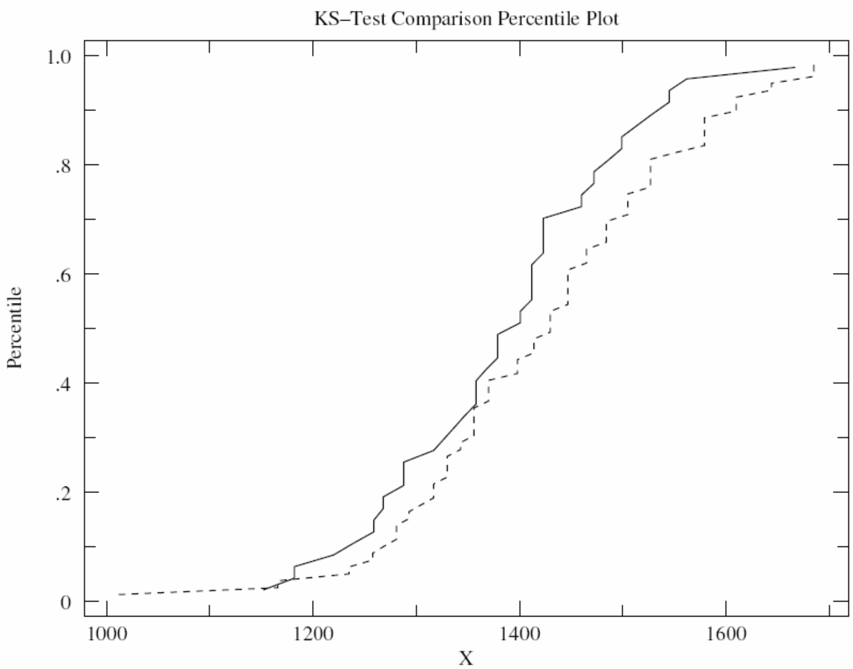
Items in Data Set 2: 2005

1.012 1.166 1.166 1.235 1.235 1.258 1.258 1.269 1.281 1.281 1.281 1.293 1.293 1.305 1.317 1.317 1.317 1.330 1.330 1.330 1.330 1.343 1.343 1.356 1.356 1.356 1.356 1.356 1.370 1.370 1.370 1.370 1.398 1.398 1.398 1.414 1.414 1.414 1.430 1.430 1.430 1.430 1.447 1.447 1.447 1.447 1.447 1.447 1.465 1.465 1.465 1.484 1.484 1.484 1.484 1.505 1.505 1.505 1.505 1.527 1.527 1.527 1.527 1.527 1.552 1.579 1.579 1.579 1.579 1.579 1.610 1.610 1.610 1.644 1.644 1.685 1.685 1.685

Appendix W
(continued)

School D – Teacher 14 – Overall RESULTS





The maximum difference between the cumulative distributions, *D*, is: 0.2302 with a corresponding *P* of: 0.079

TEACHER 14 2004

OVERALL
Scaled Score 1377

Advanced	5	11%	
Proficient	28	62%	73%
Basic	11	24%	
Below Basic	1	2%	26%
Total	45		

TEACHER 14 2005

OVERALL
Scaled Score 1423

Advanced	36	46%	
Proficient	31	40%	86%
Basic	9	12%	
Below Basic	2	3%	14%
Total	78		

Appendix W
(continued)

School D – Teacher 14 – Non-Accelerated RESULTS – Student Group 12

Data Set A: 2004

- 45 data points were entered
- Mean = 1.384
- 95% confidence interval for actual Mean: 1350. thru 1418.
- Standard Deviation = 113.
- High = 1.667 Low = 1.152
- Third Quartile = 1.466 First Quartile = 1.288
- Median = 1.401
- Average Absolute Deviation from Median = 89.3

Data Set B: 2005

- 74 data points were entered
- Mean = 1.432
- 95% confidence interval for actual Mean: 1403. thru 1460.
- Standard Deviation = 124.
- High = 1.685 Low = 1.166
- Third Quartile = 1.527 First Quartile = 1.340
- Median = 1.430
- Average Absolute Deviation from Median = 101.

Kolmogorov-Smirnov Comparison of Two Data Sets

The maximum difference between the cumulative distributions, *D*, is: 0.2517 with a corresponding *P* of: 0.048

Appendix W
(continued)

School D – Teacher 14 – Non-Accelerated RESULTS – Student Group 12

Items in Data Set 1:

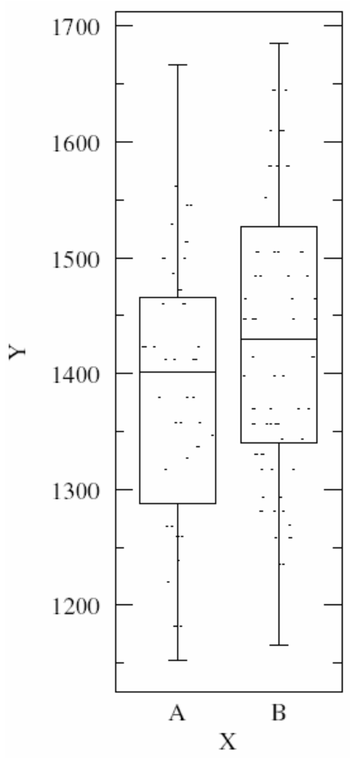
1.152 1.182 1.182 1.220 1.239 1.259 1.259 1.268 1.268 1.288 1.288 1.288 1.317 1.327 1.337 1.347 1.358 1.358 1.358 1.379 1.379 1.379 1.401 1.401 1.412 1.412 1.412 1.412 1.423 1.423 1.423 1.423 1.460 1.460 1.472 1.472 1.486 1.499 1.499 1.514 1.529 1.545 1.545 1.562 1.667

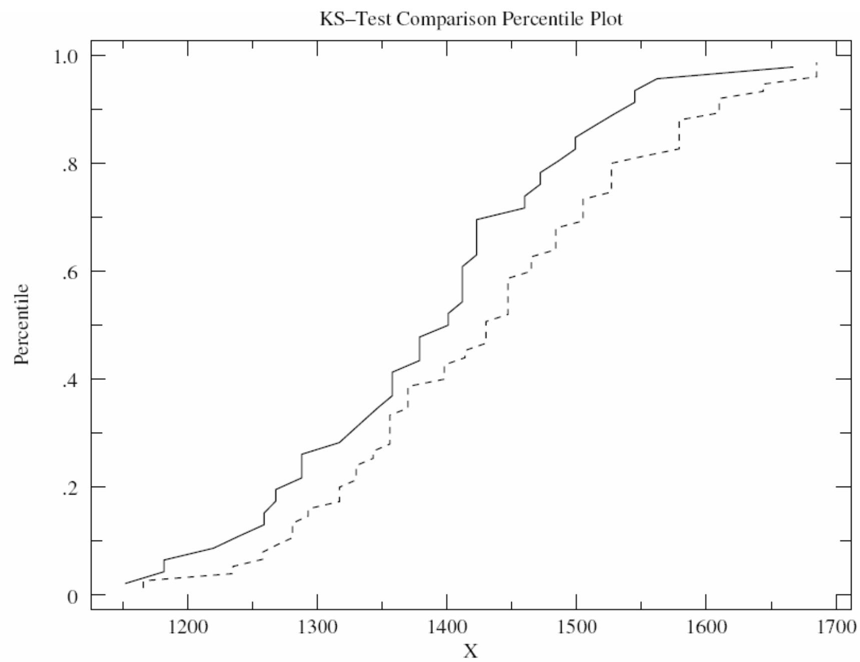
Items in Data Set 2:

1.166 1.166 1.235 1.235 1.258 1.258 1.269 1.281 1.281 1.281 1.293 1.293 1.317 1.317 1.317 1.330 1.330 1.330 1.343 1.343 1.356 1.356 1.356 1.356 1.356 1.370 1.370 1.370 1.370 1.398 1.398 1.398 1.414 1.414 1.430 1.430 1.430 1.430 1.447 1.447 1.447 1.447 1.447 1.447 1.465 1.465 1.465 1.484 1.484 1.484 1.484 1.505 1.505 1.505 1.505 1.527 1.527 1.527 1.527 1.527 1.552 1.579 1.579 1.579 1.579 1.579 1.610 1.610 1.610 1.644 1.644 1.685 1.685 1.685

Appendix W
(continued)

School D – Teacher 14 – Non-Accelerated RESULTS – Student Group 12





The maximum difference between the cumulative distributions, *D*, is: 0.2517 with a corresponding *P* of: 0.048

2004

NON-ACCELERATED

Scaled Score 1378

Advanced	5	11%	
Proficient	27	61%	72%
Basic	11	25%	
Below Basic	1	2%	27%
Total	44		

2005

NON-ACCELERATED

Scaled Score 1432

Advanced	36	49%	
Proficient	28	38%	87%
Basic	8	11%	
Below Basic	2	3%	13%
Total	74		

Appendix W
(continued)

School D – Teacher 16 (IEP ONLY) – Overall RESULTS – Student Group 13

Data Set A: 2004

- 25 data points were entered
- Mean = 1.112
- 95% confidence interval for actual Mean: 1066. thru 1157.
- Standard Deviation = 110.
- High = 1.401 Low = 925.
- Third Quartile = 1.167 First Quartile = 1.034
- Median = 1.101
- Average Absolute Deviation from Median = 81.3

Data Set B: 2005

- 23 data points were entered
- Mean = 1.209
- 95% confidence interval for actual Mean: 1159. thru 1259.
- Standard Deviation = 115.
- High = 1.430 Low = 1.026
- Third Quartile = 1.281 First Quartile = 1.118
- Median = 1.212
- Average Absolute Deviation from Median = 93.2

Kolmogorov-Smirnov Comparison of Two Data Sets

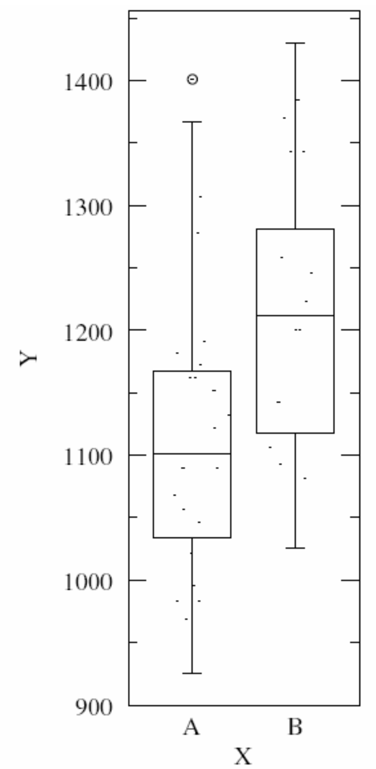
The maximum difference between the cumulative distributions, *D*, is: 0.4887 with a corresponding *P* of: 0.004

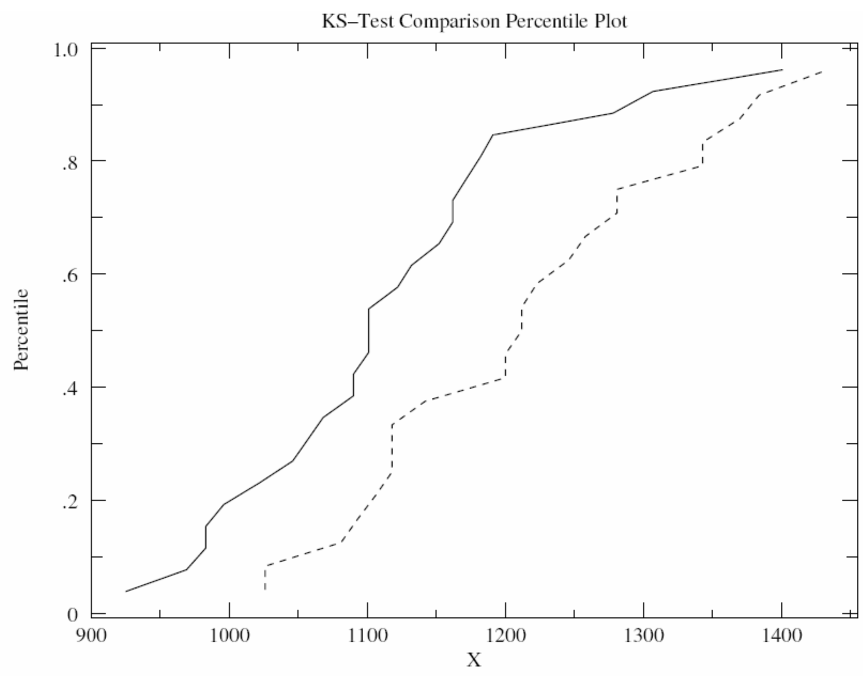
Items in Data Set 1:
925. 969. 983. 983. 996. 1.022 1.046 1.057 1.068 1.090 1.090 1.101 1.101 1.101 1.122 1.132 1.152 1.162 1.162 1.172 1.182 1.191 1.278 1.307 1.401

Items in Data Set 2:
1.026 1.026 1.081 1.093 1.106 1.118 1.118 1.118 1.142 1.200 1.200 1.212 1.212 1.223 1.246 1.258 1.281 1.281 1.343 1.343 1.370 1.384 1.430

Appendix W
(continued)

School D – Teacher 16 (IEP ONLY) – Overall RESULTS – Student Group 13





The maximum difference between the cumulative distributions, *D*, is: 0.4887 with a corresponding *P* of: 0.004

2004

IEP

Scaled Score 1130

Advanced	0	0%	
Proficient	2	8%	8%
Basic	3	12%	
Below Basic	20	80%	92%
Total	25	.	

2005

IEP

Scaled Score 1209

Advanced	0	0%	
Proficient	5	22%	22%
Basic	9	39%	
Below Basic	9	39%	78%
Total	23		

VITA

Robert M. McGee III rmcgee@neshaminy.k12.pa.us
4 Peachtree Court Cell: 609-304-4734
Eastampton, NJ 08060 Home: 609-265-2027

EDUCATION:

Drexel University 2002 – 2006
Doctor of Philosophy
Educational Leadership and Learning Technology

Philadelphia College of Textiles and Science 1988 – 1990
Master of Science
Instructional Technology
Summa Cum Laude

Shippensburg University 1983 – 1987
Bachelor of Science in Education
Secondary Mathematics
Summa Cum Laude

CERTIFICATION:

Assistant Superintendent's Letter of Eligibility 2004

Instructional Level II – Secondary Mathematics 1987

EXPERIENCES:

Middle School Math Tutor/Coach 2004 – Present
Curriculum and Instruction Department
Neshaminy School District

Treasurer 2000 – Present
Neshaminy Federation of Teachers
AFT Local 1417

Mathematics Teacher and Department Chair 1987 – 2004
Carl Sandburg Middle School
Neshaminy School District

INTERESTS:

Initiative Implementation Design
School Improvement Initiatives
Understanding Change
School Leadership
School Culture