

IS THERE A RELATIONSHIP BETWEEN ACADEMIC ACHIEVEMENT AND
SCHOOL CLIMATE AT THE ELEMENTARY, MIDDLE, OR
HIGH SCHOOL GRADE LEVEL?

by

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Completing this program has been an arduous task. If this were easy, everyone would become doctors. It has been said that it is the journey not the destination that is most fulfilling. In this case, the journey has been challenging and rewarding and reaching the destination has produced a sense of confidence and satisfaction.

I have established new relationships that will last a lifetime. In addition, I have acquired a wealth of very useful information that has equipped me to be of service to others. It has been worth the effort.

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ABSTRACT

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Researchers have determined that many factors, including school climate, may be contributing to the lack of academic achievement of many of our students. In an effort to better understand this issue, this study tested for possible relationships between the school climate of multiple schools in Palm Beach County, Florida, and their students' academic achievement. Separate analyses were done at the elementary, middle, and high school levels. For the purpose of this study, academic achievement (criterion variable) was measured by the Florida Comprehensive Assessment Test, Math and Reading sections. School climate (predictor variable) was measured by the school district's yearly climate survey.

In order to test the study's hypotheses, a linear multiple regression model using SPSS software was run to measure for any relationship between the criterion and predictor variables at the elementary, middle, and high schools levels. The relationships

of individual predictors with the criterion were tested with correlations and the model including all seven predictors was tested with multiple regressions.

DEDICATION

God has blessed me with the best life a man can have. I have an awesome wife, Lynn. She has been everything to me. Everything I have that is good and worthwhile can be directly linked to her. Together we have created a family with three beautiful daughters who will each have a profound impact on this world. They inspire me to be the best I can be.

I have also been blessed with two sets of parents, Samuel and Leona Doyal, and Howard and Esther Miller. They have been encouragers and role models. They provided wonderful examples of what great parents and spouses should be. I owe them a debt of gratitude and only hope I can repay them for their love and support. I would like to thank my entire family for their love and encouragement.

This and all my work is inspired by the one true living God who shows me love, mercy, faithfulness, and kindness. Through His sacrifice I have learned what it means to serve others. I dedicate this work and my life to Him and my loved ones.

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LIST OF TABLES xii

CHAPTER

| | | |
|---|--|----|
| 1 | INTRODUCTION | 1 |
| | Background of the Study | 2 |
| | Statement of the Problem..... | 5 |
| | Purpose of the Study | 5 |
| | Definitions | 6 |
| | Research Questions..... | 8 |
| | Research Hypotheses | 9 |
| | Assumptions..... | 9 |
| | Limitations | 10 |
| | Delimitations | 10 |
| | Significance of the Problem | 11 |
| | Chapter Summary | 12 |
| 2 | REVIEW OF THE LITERATURE | 13 |
| | Historical Perspective of Current Educational Policies | 14 |
| | School Climate Overview | 15 |
| | Theoretical Underpinnings..... | 16 |
| | Work Environment and Teacher Retention | 17 |
| | Administrative Leadership..... | 18 |
| | Teacher Leaders | 20 |
| | Social and Interpersonal Interaction | 22 |
| | Minority Groups..... | 22 |
| | Perceptions of Minority Groups | 23 |
| | Voluntary Segregation | 24 |
| | Discussing Race in the Classroom..... | 24 |
| | School Safety | 25 |
| | Bullying | 26 |
| | Sexual Orientation | 26 |
| | Students With Disabilities..... | 27 |
| | Civic Awareness/Democratic Values | 28 |

| | |
|--|----|
| Confidence in School-Site Factors..... | 30 |
| Academic Emphasis of Schools..... | 31 |
| Collective Efficacy..... | 31 |
| Trust..... | 31 |
| Collaborative Schools..... | 32 |
| Parental Confidence..... | 32 |
| Peers..... | 33 |
| Teacher Influences..... | 33 |
| Surveys..... | 33 |
| Climate Surveys..... | 34 |
| Standardized, High-Stakes Tests..... | 35 |
| Background..... | 35 |
| Advocacy of Standardized High-Stakes Tests..... | 36 |
| Arguments Against High-Stakes Standardized Tests..... | 36 |
| The Florida Comprehensive Assessment Test..... | 37 |
| School Level..... | 38 |
| Conclusions..... | 38 |
| | |
| 3 METHODS AND PROCEDURES..... | 39 |
| Purpose of This Study..... | 39 |
| Research Design..... | 40 |
| Criterion and Predictor Variables..... | 40 |
| Research Questions..... | 41 |
| Subjects..... | 41 |
| Palm Beach County Schools..... | 42 |
| Facts Related to Palm Beach County Schools..... | 42 |
| Palm Beach County Schools Demographic Information..... | 44 |
| Free and Reduced Price Lunches..... | 47 |
| Socioeconomic Status and Academic Achievement of Palm Beach County School Students..... | 47 |
| Instruments..... | 48 |
| The School Effectiveness Questionnaire: Teacher Version..... | 48 |
| Florida Comprehensive Assessment Test..... | 49 |
| Data Collection..... | 50 |
| Ethical Considerations..... | 51 |
| Data Analyses..... | 52 |
| Chapter Summary..... | 52 |
| | |
| 4 ANALYSIS OF DATA..... | 53 |
| Description of the Subjects..... | 53 |
| Research Question Analysis..... | 54 |
| Research Question 1..... | 58 |
| Findings..... | 58 |
| Research Question 2..... | 59 |
| Findings..... | 59 |
| Research Question 3..... | 59 |

| | |
|--|-----|
| Findings | 59 |
| Research Question 4 | 60 |
| Findings | 60 |
| Research Question 5 | 60 |
| Findings | 60 |
| Research Question 6 | 60 |
| Findings | 61 |
| Conclusions | 61 |
| 5 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS | 63 |
| Summary of Findings | 66 |
| Research Question 1 | 67 |
| Findings..... | 67 |
| Conclusions | 67 |
| Research Question 2 | 73 |
| Findings | 73 |
| Conclusions | 73 |
| Research Question 3 | 77 |
| Findings | 77 |
| Conclusions | 78 |
| Research Question 4 | 81 |
| Findings | 82 |
| Conclusions | 82 |
| Research Question 5 | 86 |
| Findings | 87 |
| Conclusions | 87 |
| Research Question 6 | 90 |
| Findings..... | 90 |
| Conclusions | 91 |
| Discussion of Correlations | 94 |
| FCAT Math and FCAT Reading Scores and Positive School Climate | 95 |
| FCAT Math and FCAT Reading Scores and High Expectations | 96 |
| FCAT Math and FCAT Reading Scores and Frequent Monitoring of Student Progress | 96 |
| FCAT Math and FCAT Reading Scores and Time on Task | 97 |
| FCAT Math and FCAT Reading Scores and Positive Home-School Relations | 97 |
| FCAT Math and FCAT Reading Scores and Instructional Leadership | 98 |
| FCAT Math and FCAT Reading Scores and Clear and Focused Mission ... | 99 |
| Conclusions of Correlation Data | 99 |
| Summary and Conclusions | 100 |
| Recommendations | 103 |
| Recommendations for Future Research | 104 |

APPENDIX

A Mean SEQ Scores and Weighted Mean FCAT Reading and Math Scores With Rank Indicators of Schools Outside 1 Standard Deviation of Mean FCAT Scores and School Demographic Data 106

B SEQ:TV Survey Items 110

C Formulas for Calculating High School Math Mean Scale Scores in Microsoft Access 114

D Mean SEQ:TV Dimension and Cumulative School Scores With Weighted FCAT Math and Reading Scores..... 116

REFERENCES 123

LIST OF TABLES

| | | |
|-----------|---|----|
| Table 1. | Demographic Make-up of Palm Beach County Schools 2007 School Year | 45 |
| Table 2. | Means and Standard Deviations of the 2007 SEQ:TV Scores and Elementary FCAT | 55 |
| Table 3. | Means and Standard Deviations of the 2007 SEQ:TV Scores and Middle School FCAT | 56 |
| Table 4. | Means and Standard Deviations of the 2007 SEQ:TV Scores and High School FCAT..... | 56 |
| Table 5. | Correlations Among SEQ and FCAT Scores for Elementary Schools | 57 |
| Table 6. | Correlations Among SEQ and FCAT Scores for Middle Schools..... | 57 |
| Table 7. | Correlations Among SEQ and FCAT Scores for High Schools | 58 |
| Table 8. | Mean Elementary School FCAT Math and SEQ:TV Scores With Deviation From Mean Indicators | 70 |
| Table 9. | Mean Middle School FCAT Math and SEQ:TV Scores With Deviation From Mean Indicators | 75 |
| Table 10. | Mean High School FCAT Math and SEQ:TV Scores With Deviation From Mean Indicators | 80 |

| | | |
|-----------|--|----|
| Table 11. | Mean Elementary School FCAT Reading and SEQ:TV Scores With Deviation From Mean Indicators | 84 |
| Table 12. | Mean Middle School FCAT Reading and SEQ:TV Scores With Deviation From Mean Indicators | 89 |
| Table 13. | Mean High School FCAT Reading and SEQ:TV Scores With Deviation From Mean Indicators | 93 |

CHAPTER 1

INTRODUCTION

The goal of most educators is to maximize the learning for each student being served. As all stakeholders endeavor to meet this goal, a great disparity in the academic achievement of these students has been noted. Only a portion of this disparity can be accounted for by the differences in the cognitive abilities of individual students.

Observations and experiences documented by researchers in a diverse set of educational settings illuminate issues other than academic abilities that affect academic achievement. These observations raise fundamental questions about how to maximize learning. Factors such as (a) administrative leadership, (b) social/interpersonal relationships of students and staff, (c) democratic/civic values, (d) collective and self-efficacy, (e) school discipline policies, and (f) socioeconomic status seem to have a profound effect on school climate and ultimately, academic achievement (Bransford & Darling-Hammond, 2005). An effective study of school climate requires a wide-angle, macro lens that captures a broad perspective.

Researchers have determined that many aspects of education including school climate may be contributing to the lack of academic achievement of many students (Cambourne, 1995; Caroline, Dallas, Horn, Strahan, & Ware, 2003; Goddard, Hoy, & Hoy, 2000; National Conference of State Legislatures, 2007). To better understand this issue, additional studies to test for possible interrelationships between school climate and academic achievement need to be implemented. For the purpose of this study, academic

achievement was measured by the standardized high-stakes tests (Florida Comprehensive Assessment Test, Math and Reading [FCAT]) administered by the School District of Palm Beach County. School climate was measured by the yearly climate survey of schools administered by the School District of Palm Beach County (School Effectiveness Questionnaire).

School districts take many steps to maximize academic achievement, including (a) providing bilingual education; (b) initiating English to Speakers of Other Languages (ESOL) mandates; (c) articulating curriculum standards; (d) demanding greater accountability through standardized tests; and (e) implementing other measures. Despite these efforts, many students are failing and dropping out of school without completing their education (Haycock & Peske, 2006). Understanding any correlations between a school's climate and its students' academic achievement may provide valuable insight for educators seeking to improve the performance of their schools.

Background of the Study

A common goal of educators is to prepare young people to be productive members of society (Apple & Beane, 1995). Though most educators work diligently to prepare their students to accomplish this goal, additional factors that are out of their control have an impact on their performance. These factors often create obstacles that impede educators' efforts to positively affect academic achievement. These factors include (a) fractured families, (b) cultural clashes, (c) racial biases, (d) school-site management, (e) socioeconomics, and (f) discipline problems (Bransford & Darling-Hammond, 2005; Haycock & Peske, 2006). Many of the challenges and issues in our education system parallel societal issues related to (a) race, (b) gender bias, (c) sexual

orientation, (d) ethnic division, and (e) social class differences. These social issues become a part of the fabric of our schools and impact the over-all climate. To mitigate the effect of social issues on the academic achievement of our students, educational leaders must be informed, equipped, and motivated to intervene (Glover, 2007; Gruenert, 2005; Hoyle, English, & Steffy, 1985).

Schools that nurture productive thought, constructive behavior, and a climate of civil interaction take advantage of the social nature of learning (Dewey, 1916; Vygotsky, 1978). Creating such a climate takes careful planning and dedication from all participants. Educational leaders and everyone else involved need to understand the specific characteristics of school climate and how it interacts with teachers, administrators, students, staff and community members. These climate characteristics must be considered simultaneously as educators face the everyday challenges of education and pedagogy (Bransford & Darling-Hammond, 2005; Freire, 2000; Haycock & Peske, 2006; Heck, 2000). To successfully meet these challenges, educators must possess multiple skill sets. A highly qualified teacher must be able to exhibit (a) well-developed classroom management techniques; (b) content knowledge; (c) pedagogical content knowledge; (d) skills related to inclusion of exceptional education students; (e) strategies to teach English Language Learners; and (f) the ability to adapt to the fluid nature of the classroom (Bransford & Darling-Hammond; Darling-Hammond, 2000).

A controversial factor affecting school climate is high-stakes testing. The *No Child Left Behind Act* (NCLB) puts mandates on every school that receives federal funding (U.S. Department of Education, 2003). NCLB requires more accountability through the administering of high-stakes tests (Florida Department of Education

[FLDOE], 2004). Unfortunately, this testing has created significant unanticipated stress at school sites (Amrein & Berliner, 2002; Bowers, 1989; O'Neil, 1992; Popham, 2001). This stress has led to a new phrase in the lexicon of education “teaching to the test.” There is a great deal of debate as to the cost and benefits of such testing. This is another example of the many challenges that complicate the education process and affect overall school climate.

Other factors such as increasing cultural diversity, poverty, crime, drug and alcohol abuse, and ever widening political divisions further complicate the education process and affect school climate. Each of these issues is further complicated by constituency groups that advocate for very different and often competing solutions as they seek to influence policy and curriculum. These internal and external influences often put students and teachers in the middle of the political struggles between these groups, contributing to a potentially negative school climate, and as such are relevant to this study.

According to many studies of school climate, the perceptions of leadership support, confidence in parental support, student commitment, self- and collective efficacy of staff members, and the commitment to democratic values all influence the actual and perceived school climate (Apple & Beane, 1995; Daugherty, Kelly, & Thornton 2005; Goddard, Hoy, & Hoy, 2000 Hoy, Hoy, & Tarter, 2006). All of these issues are reported to have an effect on academic achievement and school climate. It can be beneficial to test the relationship between school climate and the measured achievement of students as directed by the Florida Department of Education. The success of schools may be

enhanced as policy makers are provided more information regarding the relationship between school climate factors and academic achievement.

Statement of the Problem

Despite the sincere effort of many selfless individuals, many schools are not achieving their academic goals (Haycock & Peske, 2006). This lack of success poses significant challenges to educators, who expected to meet the goals as articulated in their mission statements and comply with mandated educational standards (Cohen, Fuhrman, & Mosher, 2007, p. 87). According to the U.S. Department of Education's *State Accountability Plans* (2004), the NCLB has endeavored to hold everyone in the education system accountable for the education of all students. This accountability is determined through the use of several measures including the administering of rigorous high-stakes tests (Amrein & Berliner, 2002; O'Neil, 1992). Though these evaluation tools help identify schools that are not meeting predetermined standards, they are not sufficient to rectify the problem. Other measures are needed to identify the causes that may influence poor academic achievement by students.

Purpose of the Study

The purpose of this study was to determine if there is a relationship between school climate and academic achievement. For the purpose of this study, school climate will be measured by the annual climate survey administered by Palm Beach County Schools entitled the School Effectiveness Questionnaire: Teacher/Staff Version (SEQ:TV) and academic achievement will be measured by FCAT Math and Reading mean scale scores. These analyses were performed at the elementary, middle, and high school levels. It was the goal of the researcher to contribute to the body of knowledge

that enables educators and those working in the field to make informed decisions when writing policies, designing instruction, and developing curriculum. This study was intended to offer a model of how to provide and utilize reliable data for educational stakeholders.

Definitions

The following are definitions of terms used in this study:

Academic Achievement: The scores achieved on the Math and Reading sections of the FCAT.

School Climate: According to Barber, Homana, and Torney-Purta (2006), school climate is defined as “The impressions, beliefs, and expectations held by members of the school community about their school as a learning environment, their associated behavior, and the symbols and institutions that represent the patterned expressions of the behavior” (p. 1).

School Effectiveness Questionnaire: Teacher/Staff Version (SEQ:TV): The annual questionnaire administered by the School District of Palm Beach County: it measures teacher and staff perceptions of their school’s climate.

Administrative Leadership: When considered within the setting of a school, it is the process of articulating a vision that promotes teamwork, collaboration, and sharing (Donaldson & Sanderson, 1996) and fostering a climate of collegial interactions (Hargreaves, 1994).

Social and Interpersonal Interaction (issues related to race, ethnicity, gender, sexual orientation, disabled persons, safety, etc.): The “contexts of socialization” that shape learning achievement and adjustment (Trickett, 1978).

Civic Awareness/Democratic Values: The values that drive the policies and aspirations of the school. For the purpose of this study as defined by Apple and Beane (1995), Democratic schools are both (humanistic and child centered) . . . in many ways, but their vision extends beyond purposes such as improving the school climate or enhancing students' self-esteem. Democratic educators seek not simply to lessen the harshness of social inequities in school, but to change the conditions that create them. (p. 11)

Confidence of School-Site Factors: The confidence school staff members have in their peers' abilities and dedication, the positive and supportive involvement of parents, and the overall commitment to academic achievement by all stakeholders.

Florida Comprehensive Assessment Test (FCAT): A standardized test that consists of two components: a criterion-referenced test and a norm-referenced test. The criterion-referenced test assesses mathematics, reading, science and writing skills, and the norm-referenced test assesses students' performances compared to national norms. The FCAT is one component of the state's overall assessment of a school's performance. Students are given the FCAT to measure their mastery of the skills articulated in the Sunshine State Standards. Students in Grades 3-11, including limited-English proficient (LEP) and exceptional education (ESE) students, take the FCAT. At the request of parents, home-schooled students may take the FCAT. The areas assessed on the FCAT include reading, writing, mathematics, and science.

Teacher Leaders: Teachers who work with colleagues for the purpose of improving teaching and learning, whether in a formal or an informal capacity (Ackerman & Mackenzie, 2006).

Criterion Variable: In a multiple regression analysis, this is the variable that is being predicted. It is also known as the dependent variable.

Predictor Variable: The variable used in a multiple regression analysis to predict another variable. It is also known as the independent variable.

Research Questions

The research questions related to this study are founded on the need to know whether school climate and academic achievement are related. The sources of data and the information being sought helped frame the questions. The following are six questions that this study has answered:

1. Are the school climate scores from the seven dimensions of the SEQ:TV (instructional leadership, clear and focused mission, positive school climate, high expectations, frequent monitoring of student progress, time on task and positive school/home relations) related to FCAT Math scores at the elementary school level?
2. Are the school climate scores from the seven dimensions of the SEQ:TV related to FCAT Math scores at the middle school level?
3. Are the school climate scores from the seven dimensions of the SEQ:TV related to FCAT Math scores at the high school level?
4. Are the school climate scores from the seven dimensions of the SEQ:TV related to FCAT Reading scores at the elementary school level?

5. Are the school climate scores from the seven dimensions of the SEQ:TV related to FCAT Reading scores at the middle school level?

6. Are the school climate scores from the seven dimensions of the SEQ:TV related to FCAT Reading scores at the high school level?

Research Hypotheses

There are six null hypotheses that will be tested in this study. They are:

$H_0 1$: The school climate dimensions of the SEQ:TV are not related to FCAT Math scores at the elementary school level.

$H_0 2$: The school climate dimensions of the SEQ:TV are not related to FCAT Math scores at the middle school level.

$H_0 3$: The school climate dimensions of the SEQ:TV are not related to FCAT Math scores at the high school level.

$H_0 4$: The school climate dimensions of the SEQ:TV are not related to FCAT Reading scores at the elementary school level.

$H_0 5$: The school climate dimensions of the SEQ:TV are not related to FCAT Reading scores at the middle school level.

$H_0 6$: The school climate dimensions of the SEQ:TV are not related to FCAT Reading scores at the high school level.

Assumptions

The researcher makes the following two assumptions:

1. The SEQ:TV instrument is administered annually to the entire staff of almost every school in Palm Beach County. It can be assumed that not every answer is completely accurate. These questionnaires seek to get a snapshot of the staff's

perceptions at that time. Staff members are not asked to present data or evidence to support their opinions.

2. Because the results are confidential, it will be assumed that the staff members may have confidence that they can state their opinions about the issues addressed in the survey without fear of retribution.

Limitations

The following five limitations may impact this study:

1. This study does not include schools in the district over a period of multiple years to note trends.
2. This study focused on one school district and did not study multiple districts with multiple sets of policies.
3. This study may have been limited because certain factors may not be knowable before the study is completed. Those unknown factors may have influenced the results.
4. The staff members of the schools with failing grades may have looked to affix blame in areas that may not be relevant. These misconceptions may be a result of the inherent problems at that site.
5. This study focused on the school climate perceptions of staff members only and did not include parents and students.

Delimitations

Three possible delimitations may impact the findings in this study:

1. This study only used the SEQ:TV survey to measure climate. This study focused on the perceptions of teachers, administrators, and nonacademic staff such as

cafeteria workers, custodians, and others. However, the perceptions of students were excluded from this study. Therefore, the perception of climate and its relationship to student achievement cannot be generalized to students. Schoolwide climate may have been affected by attitudes and behaviors of this excluded group, yet their opinions were not included, nor will they be generalizable to other studies that include students in the data collection. To include these factors, an additional study would be needed.

2. School climate can be defined using several factors. This study did not consider political policies, international policies or some of the other factors that have been studied and included in the arena of discussion of school climate.

3. Although there are many kinds of standardized tests, including other forms of the FCAT, this study used the FCAT Reading and FCAT Math as the only measures of student achievement.

Significance of the Problem

Research conducted by Heck (2000) and Goddard et al. (2000) found links between school climate and academic achievement. The importance of these studies is that they discuss the research indicating that schools may be affected by multiple climate factors simultaneously. The authors state that their research leads them to conclude that school climate can have a considerable effect on academic achievement. According to Hoyle et al. (1985):

School climate may be one of the most important ingredients of a successful instructional program. Without a climate that creates a harmonious and well functioning school, a high degree of academic achievement is difficult, if not downright impossible to obtain. (p. 15)

This research project cited numerous studies linking student achievement to various aspects of school climate. The significance of this study is that it measured the effects of a composite of climate factors on student achievement. The majority of other studies cited in this study tend to focus on a single characteristic. It has been determined by the school district where this study took place that to accurately measure school climate, it is best to measure multiple dimensions and then synthesize them to create a profile of the climate of each school. The School District of Palm Beach County (2007) has developed a tool to measure school climate, which focuses on seven dimensions. It is the school district's research that has led it to determine that these seven dimensions together create a school's climate. The seven dimensions are:

1. Instructional leadership.
2. Clear and focused mission.
3. Positive school climate.
4. High expectations.
5. Frequent monitoring of student progress.
6. Time on task.
7. Positive home/school relations.

Chapter Summary

The main goal of this study was to determine whether there was a relationship between academic achievement (criterion variable) and school climate (predictor variable). FCAT Math and Reading scores served as the criterion variables. A school climate survey provides the predictor variables.

CHAPTER 2

REVIEW OF THE LITERATURE

The focus of this literature review was determined by this study's research questions. It provides background information related to this study of school climate and its possible relationship to academic achievement. The findings of educational philosophers and researchers regarding various issues related and reported to have an effect on school climate have been examined. A historical perspective of current educational policies is provided in this chapter.

The overarching research question is, "Does school climate affect academic achievement?" This chapter provides a look at current research related to how climate factors affect academic achievement. Additional variables addressed in this review are (a) interpersonal interaction (Ettman, 2003); (b) administrative leadership (Birky, Davidhizar, & Headley, 2006); (c) economic status; (d) survey instruments and analysis (Nguyen, 2007); (e) civic awareness (Kahne, Rodriquez, Smith, & Thiede, 2000); (f) confidence in school-site factors (Hoy et al., 2006); and (e) standardized testing procedures (Kamii, 1990).

This literature review is organized into eight sections: (a) Historical Perspective of Current Educational Policies, (b) Administrative Leadership, (c) Teacher Leaders, (d) Social and Interpersonal Interaction, (e) Civic Awareness/Democratic Values, (f) Confidence in School-Site Factors, (g) Surveys, (h) Standardized High-Stakes Tests, and

(j) School Level. The studies reviewed in this chapter provide background information related to this study.

Historical Perspective of Current Educational Policies

Historically, educational policies have evolved in an attempt to resolve a wealth of issues. These policies were designed to address issues such as (a) who will be educated; (b) how the curriculum is structured; (c) what is the ultimate purpose for education; (d) who the educational decision makers will be; and (e) what are the rights of students (Cohen et al., 2007; Kliebard, 2004; Pinar, 2003). This review examines some of the conclusions that researchers have made regarding the impact these policies have had on the climate of our schools today and, ultimately, on academic achievement.

American education in the past century experienced many reform movements that addressed a variety of issues. What has been relatively constant is the desire to prepare students to participate in our society as productive citizens (Apple & Beane, 1995; Barber et al., 2006; Dewey, 1916). In an attempt to improve the state of American education, the U.S. federal government created the Department of Education and has endeavored to set measurable standards for schools that help establish equitable distribution of capital and educational opportunity for all students (Cohen et al., 2007). As a part of the NCLB, these standards are used to define educational success. Virtually every public school in America is being held accountable for student achievement by means of high-stakes testing (Amrein & Berliner, 2002). Florida schools, like their students are graded on a scale from A to F. These grades are assessments based on a combination of factors including (a) scores on the Florida Comprehensive Assessment Test (FCAT); (b) school

discipline data; (c) graduation rates; (d) dropout rates; (e) attendance; and (f) preparation for college (Curda, Martindale, Pilcher, & Pearson, 2005).

Some of the stated goals of the U.S. Department of Education (2003) are to provide every child a quality education, provide every classroom with a quality teacher, and leave no child behind. This very complicated issue has been studied extensively and examined from a wide range of perspectives including (a) economics (Ferguson & Mehta, 2004); (b) socio-cultural issues (Gay, 2002); (c) cognitive learning styles (Gardner, 1993); (d) school climate (Barber et al., 2006); (e) curriculum design; and (f) school management (Cohen et al., 2007). Though many studies have documented great educational successes, many children continue to be shortchanged especially in schools that have been clearly identified as having the greatest needs (Haycock & Peske, 2006).

School Climate Overview

According to Webster's (1987) *Dictionary of the English Language*, climate can be defined as "the trend of opinions and attitudes pervading a community, nation or period" (p. 184). When applied to a school, attitudes, standards and conditions take on specific characteristics related to that school. Leadership styles, economic demographics, socioeconomic factors, geographic location, attitudes toward learning, attitudes toward the institution, political differences, sexual orientation, racial diversity, language differences, and multiple cultural influences are all intertwined in a fluid dance creating a unique cultural ecosystem (Bailey, 2003; Cambourne, 1995; Cummins, 1979; Daugherty et al., 2005; Ferguson & Mehta, 2004; Freire, 2000; Gay, 2000; Grant, Hansman, Jackson, & Spencer, 1999; Hoy et al., 2006). Over the past three decades, these factors have each consumed a greater percentage of the collective schools' attention (Cole &

Gallego, 2001). The challenge as it relates to this study was to determine whether school climate is affected in the context of the overarching issue of academic achievement.

The schools are comprised of a variety of components such as the students, faculty, and administration. In a properly functioning school, each part works in concert with the others to sustain health and productivity (Ainscow, Hopkins, & West, 1994). Any disharmony can affect the climate of a school. Students, staff, parents, administrators, community, instructors, school boards, school facilities, state and federal governments, and even businesses all have a unique function in the life of the school and, as such, all affect its health and well-being (Calvo, Marion, Lawrence, & Picus 2005; Cambourne, 1995; Caroline et al., 2003; Cohen et al., 2007; Dowson, McInerney, & Yeung, 2005; Holdaway, 2000).

According to Kliebard (2004), throughout American history, and even before America was formed as a nation, what constituted a healthy school climate has evolved. Interest groups and reform advocates (social meliorists, progressives, mental disciplinarians, humanists, developmentalists, social efficiency proponents, etc.) sought to define the mission of education. These groups worked to shape school policies in order to fit their own agendas. Kliebard believes that even within individual movements such as progressive education consensus is elusive and that every group has its own political agenda. Additionally he posits that when each member of the educational body is working in its own best interest and not for the overall good, school climate is negatively affected.

Theoretical underpinnings. Not all researchers or educational theorists agree that climate is an important factor in the academic achievement of students. A landmark study

by Coleman et al. (1966) sparked a great deal of debate, shocking educators with research conclusions that factors such as school climate have a negligible effect on student achievement and concluding that it was family background that would account for the majority of variance in student achievement. This was not vigorously refuted until Edmonds (1979) challenged these assertions. Edmonds began a renewal in research that linked school factors, such as (a) administrative leadership; (b) high academic expectations for students; (c) an emphasis on basic skills; (d) frequent and systematic evaluation of academic progress; and (e) an orderly climate to what was needed to support student achievement (Hoy et al., 2006).

Work environment and teacher retention. A number of studies also link school climate to factors that have an indirect effect on student achievement. One such factor is the effect that school climate has on staff members and how they view their work environment.

One of the stated goals of NCLB is to assure the nation that a highly qualified teacher is leading every classroom (U.S. Department of Education, 2003). Yet one of the hindrances to this goal is the extremely high teacher attrition rate. Between 30% and 50% of teachers leave the profession within five years of entering it (Darling-Hammond, 2000). This revolving door does not allow teachers to gain the experience necessary to move along the continuum from novice to proficient to expert (Berliner, 2001). According to the National Conference of State Legislatures (2007), the working environment (climate) is the biggest factor influencing whether teachers stay in the profession. The organization quotes dissatisfied teachers as citing the following climate

issues in the workplace as reasons for leaving the profession: (a) lack of administrative support, (b) poor student behavior, and (c) negative school climate.

This is further evidence that issues related to climate affect student achievement. Yet there is often no clear line from one factor to another: The path is circuitous (Darling-Hammond, 2000). A poor climate affects the work environment, in turn affecting teacher retention in turn affecting teacher quality, ultimately affecting student achievement. As a result, massive plans expending precious resources are being implemented to recruit and retain high-quality teachers (American Federation of Teachers, 2007) instead of investing in developing existing teachers to become experts.

Administrative Leadership

Many studies indicate that the way in which leaders lead is perhaps the single most influential factor for determining school climate and ultimately academic achievement (Blackburn, Hutchison, & Martin, 2006; Blasé & Blasé, 1999; Castle & Mitchell, 2005). Leaders set the tone for every facet of the school (Chu & Fu, 2006; Daugherty et al., 2005). Principals and administrators have a profound effect and can influence the success or failure of their school (Daugherty et al.). The influence on the overall environment is directly related to their leadership style.

Moorhead and Griffin (2004) define leadership as the way an individual influences people, inspires and motivates them and guides their activities to complete the group's or organization's goals. Effective leaders increase an organization's likelihood of success. They help an organization in meeting its goals, gaining a competitive advantage, fostering ethical behavior, and properly managing a diverse workforce.

A study by Blackburn et al. (2006) endeavored to add to the body of research by answering two questions.

1. To what degree is the conflict management style of the principal related to the culture factors of professional development and teacher collaboration?

2. To what degree does gender change the relationship of the conflict management style of the principal on the school culture factor of professional development and the school culture factor of teacher collaboration? (pp. 246-248).

Blackburn et al. (2006) discuss how each principal is unique in his or her approach to the task of running his or her school, suggesting that gender becomes an issue when discussing principal leadership styles and the fact that societal stereotypes still exist regarding men and women. Assertive, dominant styles are typically attributed to males. Female characteristics are typically viewed as more integrative. As the need for a more integrative approach to schools has emerged, female characteristics have been shown to be much more acceptable and productive. Blackburn et al. found trends toward decentralization of power and participatory style leadership on an incline, causing the women's integrative approach to become the preferred style. The interpretation of the data from their study has shown that a greater use of integrative conflict management styles promotes greater professional development and teacher collaboration regardless of the gender of the principal.

A study by Blasé and Blasé (1999) suggests that the length of time out of the classroom as an administrator is not important, because they see the administrator's instructional role as one of encouraging, inviting, and promoting inquiry. What is important is his or her ability to lead teachers in the practice of critical inquiry, collective

reflection, and problem solving. Blasé and Blasé have also concluded that although instructional leadership is important for principals, the most important aspect of their job is to foster a positive and stimulating environment at their school.

School administrative leadership presents many challenges. It is a crucial component in the success of any school. The ways in which teachers perceive the leadership of their schools, fair or not, contribute to the climate of those schools. Research findings tend to support the fact that positive or negative perceptions become reality, affecting a school's climate and ultimately student achievement (Daugherty et al., 2005).

Teacher Leaders

The studies reviewed in this section examine the link between school climate and the role that teacher leaders and administrators play. They examine how teacher leaders impact school climate and how school climate impacts teacher leaders. Additionally, these studies examine the influence that administrators have on these relationships. The studies summarize the relationships that exist between teachers and principals, a range of teacher functions, school climate, and expected academic outcomes.

A study by Birky et al. (2006) discusses the effect that principals and other administrators have on teachers who are teacher leaders in their schools. The authors conclude that when administrative leaders provide the proper support, academic achievement is increased, stating, "By their words and actions, they discourage or encourage and motivate their teachers to be effective leaders. The ability of a principal to encourage and motivate leadership capacities in the building is critical for educational reform and collaboration" (p. 87).

Developing a climate that fosters teacher leadership is chronicled in an article written by Glover (2007), a principal states:

Teachers fear that their chances to influence decisions about their profession are eroding. Principals must find ways to change that perception so that teachers see that, at least in their own schools, their voices are heard and their risk taking makes a difference. My experience as a principal has taught me that engaging in honest conversation with teachers can break through the self-limiting perceptions that keep teachers silent—and can provide an opening for teacher leadership. (p. 60)

Glover concludes that how administrative leaders communicate with teachers is crucial. When administrators include teachers in the decision-making process, they are more likely to have a positive impact on school climate. When teachers perceive that they are valued professionally, they are more likely to make a positive contribution to the work environment, thus improving the climate.

Moving from teacher to teacher leader presents some challenges. Ackerman and Mackenzie (2006) describe the attributes and challenges that teachers face when they move from follower to leader. Teacher leaders are described as being on the forefront of change or being the impediment to changes that they perceive as detrimental to their students' achievement. The authors characterize them as being spokespersons for their peers when necessary or vocal advocates of their administrators. They are also described as the lone voice, willing to push back against things that others are willing to tolerate.

Previously, teacher leaders obtained formal positions such as department chair or team leader. These leaders then left the classroom to be curriculum coordinators or

consultants. Currently, teacher leaders obtain their influence from their experience and expertise in the classroom. Though formal teacher leader roles still exist, many teachers lead informally. They lead by sharing their classroom practice and expertise, questioning colleagues, mentoring new teachers, and modeling issues of teacher collaboration and best practice (Birky et al., 2006).

Social and Interpersonal Interaction

This section examines published work on the relationship between school climate and factors related to (a) minority groups, (b) school safety, (c) bullying, (d) sexual orientation, and (e) students with disabilities.

Minority Groups

Schools directly reflect the trends and social issues of the community at large. As our society becomes more ethnically diverse, issues related to race and culture become more relevant to the educational system. Minority groups play ever increasing roles in the factors that affect education. School systems are struggling to accommodate the growing number of minority students and the various challenges faced in trying to educate them (Ladson-Billings, 2006). African American students show a demonstrable gap in achievement (Kozol, 2000). The problems associated with poor climate at many schools with high minority student populations are blamed for shortchanging those students. These schools suffer from poor discipline, poor funding, low staff morale, and lower parental involvement, factors that are blamed for a very high teacher attrition rate and a less qualified caliber of teachers. All of this leads to lowered academic achievement (Haycock & Peske (2006).

Teachers need to be trained not only in content, pedagogical content knowledge, and pedagogy of teaching minority students, but also in understanding that cultural and linguistic issues are key to reaching minority groups. This understanding can happen either as a result of exposure to the various ethnic groups or through training (Gay, 2002).

Perceptions of minority groups. According to a study by Grant et al. (1999), in recent years, the number of individuals belonging to minority and ethnic groups hired by educational institutions has increased. Growing numbers of individuals from minority groups are being included in positions of authority and in other diverse positions. However, many individuals of minority status feel that they are still not treated as equals and do not have the same opportunities as those in the majority. Grant et al. address this issue by suggesting that mission statements created by educational institutions address pluralistic notions and hiring practices and attempt to deal with hiring numbers of diverse faculty and staff. However, the mere inclusion of these cultural groups does not ensure that they will have access to the power and privileges of those currently holding power in these institutions and in society as a whole.

People's perceptions can be as powerful as any concrete evidence (Gibson & Zillmann, 1994), and school climate is certainly tied to the way people feel about their work circumstances. If people of any race or ethnic background feel they are being treated unfairly, it will affect their motivation and performance, and limit their willingness to go beyond the basic requirements of their position. Racism is easy to see when it is blatant: Everyone recognizes it in its overt state. However, many minorities and those who study the issue state that there is a pervasive subtle racism that exists and that permeates many of our established institutions (Grant et al., 1999). It is true that

many institutions recognize that racism exists and address this in their mission statements and other organizational documents.

Racism is often perceived by people in very different ways and as a result has varying effects on individuals. Ogbu (1993) found that institutional racism affects minorities in different ways and has an effect on their perceptions of school and workplace climate. He states that those immigrants coming to America voluntarily for economic or political reasons for example, are far less apt to be affected by racism than those brought here by force. Ogbu speculates that voluntary immigrants are unaware of how the dominant group views them, so they do not internalize the racial prejudice that affects and overpowers other minorities.

Voluntary segregation. Minority groups often create racial barriers by their choice. Soukamneuth (2004) quotes a principal as saying that students tend to congregate together in their own ethnic groups. So as the principal and leader of the school, he is making an effort to change this because he knows these barriers create divisions that lead to prejudice and intolerance.

According to Soukamneuth (2004), the Social Policy Research Associates conducted a study for the purpose of analyzing interracial group relations and what is necessary to foster a safe and caring school climate. This study concluded that quality leadership is paramount to fostering positive inter-racial and inter-cultural relationships.

Discussing race in the classroom. Issues of race are rarely discussed in schools, especially in the elementary grades, unless in the context of a historical event. The lack of engaging curricula related to race gives importance to discussions of racial matters in the classroom. These discussions may help fill this curriculum void. Critical theorists (e.g.,

Apple & Beane, 2005; Freire, 2000) offer curriculum ideas for teachers endeavoring to teach from this perspective (Balf, Dutro, & Kazemi, 2006).

The studies noted above underscore the challenges of collecting meaningful information about race relations and their connection to school climate. The sensitivity of the subject, with the difficulty of asking appropriate questions of school community members, suggests that research results may be overly simplistic, if not compromised. Race relations play an integral role in the climate of our schools, and it is for this reason that this important issue is a part of this research project.

School Safety

A safe, nurturing school climate is an essential element of a successful educational plan. Studies indicate that students and staff perform at a higher level when institutions foster a school climate that is free from violence or threats of violence (Beran & Shapiro, 2005; Caroline et al., 2003).

School-based solutions are needed to prevent school-based violence. For example, mentoring programs have a profound effect on students who are at risk of committing acts of violence or becoming victims of violence. Mentors help students develop positive social skills, behavior standards, academic achievement, and school pride, as well as select positive friends. Developing quality, respectful, caring relationships with students and faculty attenuate the negative effects of challenging situations in which students may find themselves (Creason, Kaiser-Ulrey, Potts, and Rollin (2003).

Bullying

According to Konu and Lintonen (2006), physical health and safety are directly affected by bullying, but a school that allows a threatening climate also stifles academic achievement. Schools must be prepared to deal with bullying in a proactive manner just as Soukamneuth (2004) concluded that racial issues are best dealt with proactively. Bullying is a group phenomenon. It involves the passive students as well as the actual bullies. Students must be encouraged to intervene or to report incidents of bullying to an authority figure. Konu and Lintonen stated that students are reluctant to intervene to stop bullying, so school personnel need to educate pupils to intervene when they witness bullying. The best results occur when there are schoolwide policies in place.

The study by Beran and Shapiro (2005) also concluded that bullying is a problem that can only be eradicated with the effort of the entire school. Bullying does not occur in isolation. Part of the appeal to bullies is the public ridicule of the bullied, the feeling of power, and the feeling of acceptance when supported by observers. In essence, everyone in the school, is involved, including the bully, the victim, the passive participant, and the one who intervenes. Beran and Shapiro believed that it is important that intervention strategies include an entire school population.

Sexual Orientation

According to Bailey (2003), more than two million adolescents struggling with gender identity or sexuality are present in our schools. Too often, these students are targets of brutal physical and verbal attacks. They fear for their own safety. They are afraid to go to the bathroom, travel to and from school, or participate in school activities where they can be attacked. Bailey states that students in this category are far more likely

to have lasting emotional damage due to harassment, suffer academically, and even drop out of school. It is recommended that an adequate plan be put in place to support students facing these struggles. Policies that have zero tolerance for any kind of harassment should be in place and rigorously enforced if a school climate conducive to achievement is to exist (Bailey, 2003).

Failure to take a proactive stance to protect gay and lesbian students from harassment is a major cause of psychological problems, suicide, alcohol and other drug abuse, and homelessness within this group (McKinney & Van Wormer, 2003). The study by McKinney and Van Wormer examines what is termed the *harm reduction model*. Although sexually active gay and lesbian students are subject to the same possible negative outcomes faced by sexually active heterosexual youth, they tend to lack the support of family members, social support, and relevant sex education. According to McKinney and Wormer, “those who are taunted the most generally lack the protection of family members, teachers, and religious leaders, the people to whom youth usually turn for support” (p. 409). The facts revealed in this study seem to indicate that American schools are a toxic environment for gender-nonconforming students.

Students With Disabilities

Research also indicates that prejudices exist toward people with physical disabilities (Henderson, 1999). Junco and Salter (2004) say that students with disabilities could be considered a “forgotten minority” (p. 263), and that they face many of the stereotypes and prejudices faced by other minority groups. Gajar and Merchant (1997) report that students with disabilities complete their programs of study at a lower rate than students who do not have disabilities.

Junco and Salter (2004) conclude that even workers who assist with individuals with disabilities (e.g., rehabilitation nurses, school teachers) often exhibit negative attitudes, which in turn have a negative effect on rehabilitation and academic performance. Faculty and staff prejudices can also have a negative effect, and poor climate can prevent students from seeking the help they need. Junco and Salter's report seems to corroborate evidence presented in other studies indicating that school climate affects student achievement.

Civic Awareness / Democratic Values

Schools with a climate dedicated to civic awareness and democratic values prepare students to fulfill their dreams and aspirations and understand their roles in society (Kahne et al., 2000). The better prepared students are, the more choices they have. In addition to ensuring academic content knowledge, this preparation is intended to help students work within the framework of society (Apple & Beane, 1995; Dewey, 1916). Our government institutions are not designed to endorse any particular religion, ideology, or political affiliation: The preparation of students by schools is intended to give them the references and understanding of our governmental system so they can work within the laws, understand what is and is not acceptable, know the responsibilities of citizens, and make informed choices. Ultimately, schools intend to prepare students to be contributing citizens (Barber et al., 2006).

Torney-Purta and Vemeer (2004) state that schools assist students in understanding society and commitment to political and civic involvement. Schools can help promote the knowledge, skills and dispositions that students need in order to develop into politically conscious and socially responsible individuals.

Barber et al. (2006) define citizenship education as “The opportunities provided by schools to engage students in meaningful learning experiences such as role plays, debates, mock trials, classroom deliberations, student councils, service-learning and other active teaching strategies to facilitate their development as politically and socially responsible individuals” (p. 1).

To help develop the concept of citizenship in the broader society, schools build relationships with students that emulate those they will establish for themselves later in life. Schools provide opportunities for students to participate in civic groups, sports, academic clubs, and social clubs. In addition, they provide ways to connect to communities such as work/apprentice programs, community service, and ROTC programs. Democratic concepts are developed by means of these programs (Barber et al., 2006).

In *Democratic Schools*, Apple and Beane (1995) paraphrase John Dewey: “If people are to secure and maintain a democratic way of life, they must have opportunities to learn what that way of life means and how it might be led” (p. 7). Schools may provide these opportunities. Many students lack the experiences that foster positive relationships with society. A study by Barber, Torney-Purta, and Wilkenfield (in press) reveals that minority students have an even lower proportion of positive social experiences than other students, and that school climate is a crucial factor for the development of competent, responsible, and capable citizens.

Positive school climate is attributed to fostering mutual trust and positive civic experiences for students. Barber et al. (2006) highlight the important role that positive school climate plays in the civic development of students. To foster a positive school

climate for citizenship, all members of the school community need to be in agreement as to its importance. The school philosophy should reflect a commitment to a common civic purpose, a commitment that inspires the collective will of the school and community through best practices, instructional content, and pedagogy that promotes civic learning and commitment to political and civic engagement. Positive school climate can foster a climate that promotes the academic achievement and civic development of students.

Confidence in School-Site Factors

Teachers' attitudes have a profound effect on school climate. These attitudes permeate the entire campus. The classroom is certainly affected, but so is the teacher lounge, the cafeteria, grade-level or team meetings, and interaction with parents (Ainscow et al., 1994).

Researchers have been able to isolate factors that impact the attitudes of teachers. According to Hoy et al. (2006), the teachers with an optimistic view of their schools make a significant contribution to the academic achievement of students. Three organizational properties were noted as contributing factors to improving student achievement: (a) the academic emphasis of the school, (b) the collective efficacy of the faculty, and (c) the faculty's trust in parents and students.

In their study, Hoy et al. (2006) had the goal of identifying a new construct termed *academic optimism* (p. 426), which they used to examine student achievement while controlling for (a) socioeconomic status, (b) previous achievement, and (c) whether students attended urban or rural schools. The optimism of a school's staff and leadership is shown to affect their overall attitudes, which may in turn affect the school's climate.

Hoy et al. (2006) cite a list of school characteristics deemed to positively affect school climate and student achievement: (a) strong principal leadership, (b) high expectations for academic achievement, (c) emphasis on basic skills, (d) orderly climate, and (e) frequent and systematic evaluation of students. These characteristics are reported to positively affect the optimism of teachers.

Academic Emphasis of Schools

Academic emphasis is the degree to which a school is determined to achieve academic excellence and strive for academic achievement (Hoy & Miskel, 2005). Some of the characteristics of emphasis include setting tough but achievable academic goals, ensuring that the learning environment is orderly and rigorous, and motivating students to value academic achievement. Hoy et al. (2006) indicated that their research shows that if these things are emphasized and permeate the school's climate, academic achievement increases.

Collective Efficacy

Self-efficacy is an individual's belief about his or her ability and capacity to produce something, organize, and execute at a given level. Additionally, Hoy et al. (2006) posit that collective efficacy, as it relates to a school staff, is a teacher's perception of the entire staff's abilities as a whole, or collective. This belief has a clear impact on the optimism and general attitude of a teacher. If teachers have great confidence in their peers, the efficacy would be high, as would their achievement.

Trust

According to Hoy et al. (2006), faculty trust is defined as a willingness to be vulnerable to others because they are seen as benevolent, honest, competent, reliable, and

open. A direct link is made between teacher trust of fellow staff members and student achievement. The researchers conclude that the greater the trust, the greater the achievement of students. Trust fosters cooperation, influences greater attendance, encourages a willingness to try new things, and results in persistent learning. Hoy et al. state that trust among students, parents, and teachers produces marked improvement in student achievement.

Collaborative Schools

Fullan and Hargreaves (1996) found that collaborative schools cultivate teacher development through (a) communal support, (b) cooperative work, and (c) consensus on the values of education. They also observe that a collaborative climate is the best setting for learning for teachers as well as students. Schools that create a collaborative climate benefit from greater teacher and student performance and satisfaction.

Gruenert (2005) points out that strong parental involvement in their children's school has a positive effect not only on the school as a whole but also on the confidence of the teachers. Gruenert also states that regardless of the actual involvement of parents, the teachers' perception of that involvement affects their confidence. Gruenert indicates that teachers' perceptions are often insightful because the parental involvement is a determining factor of academic success and creating a positive academic climate.

Parental Confidence

Childs, Fantuzzo, and Tighe (2000) concluded that parental confidence in their children's academic abilities is a good predictor of academic success. If a parent believes in his or her child's general school competence, that belief translates in to an increase in the child's task-focused behaviors at school. Parents' beliefs in their children's

competence in mathematics, for example, translate to higher mathematical performance for those students.

Peers

Blumenfeld, Fredricks, and Paris (2004) state that peer interactions play a key role in academic behavior and academic achievement. Attitudes toward the importance of academics permeate the culture and climate and influence the overall motivation of students, which has an effect on achievement. Blumenfeld et al. also point out that perceived social and emotional support from peers influence the pursuit of prosocial goals, positive development of the intrinsic value of education, and development of positive self-concepts.

Teacher Influences

Teachers have a profound impact and influence on students (Dowson et al., 2005). They influence formation of students' academic sensitivity and academic behaviors. Dowson et al. state that teacher-student relationships are related to positive social behavior, educational aspirations, intrinsic ethics, and positive self-concept. All of these factors are shown to have a link to school climate. As teachers assess their environment, their perceptions of how these factors characterize their school's climate influence whether they believe in their school's ability to succeed. These perceptions culminate in either positive or negative collective-efficacy (Dowson et al., 2005).

Surveys

Surveys have been used to study school climate since the 1990s. This section of the literature review examines studies related to surveys in general and materials that address the specific use of climate surveys in research projects. According to Nguyen

(2007), surveys are instruments used in the “scientific study of people’s personalities, preferences, attitudes, practices, concerns, behaviors, and aspects of their knowledge” (p. 8). Surveys provide a way of collecting data on a myriad of subjects and can be cost-effective for researchers with limited funding and time.

Surveys can take several forms, including multiple-choice responses, a Likert-type scale for a range of agreement or disagreement, and so on. They may be (a) a paper-and-pencil form to be filled in; (b) Web-based; (c) presented in e-mail format with the researcher taking a poll to gather statistics; (d) an opinions poll; or (e) a questionnaire (Nguyen, 2007).

Climate Surveys

Many institutions view climate surveys as an essential component of their efforts to create and maintain a positive environment in which to function. According to Sullivan (2005):

The use of assessment tools such as the PACE survey is essential to capture empirical data on areas where improvement is needed and, subsequently, to measure the effects of interventions. The model offers community college leaders an approach to climate and culture change that supports and enhances institutional effectiveness. (p. 442)

The University of Wisconsin-Madison’s (2007) *Climate Survey Tips* states:

A common first step in improving climate in an organization is administering a climate inventory or survey. A survey can establish a baseline against which improvement can be measured and can point up areas of particular concern.

Results can also be a means of increased communication throughout the organization. (p. 1)

Standardized, High-Stakes Tests

Background

Standardized tests were first used in 1909 when the Thorndike Handwriting Scale was administered to assess a diverse population using a common standard (Kamii, 1990). Standardized tests would become widely used as a tool for education reformers starting in the 1960s. During that period, reforms were attempted and standardized tests were a large part of the reform plans.

The Elementary and Secondary Education Act (ESEA) implemented in 1965 dedicated federal funds to American school districts. To measure outcomes, minimum competency exams were administered. Tests such as the Metropolitan Achievement Test and the Comprehensive Tests of Basic Skills focused on low-level skills and basic understanding of content (Popham, 2001).

Norm-referenced tests were used prior to standards-based assessment. One widely used norm-referenced test was the Stanford Achievement Test. Other tests include the Iowa Test of Basic Skills, the California Test of Basic Skills, the California Achievement Test, and the Achievement Test. Education models founded on standards-based instruction require their own unique assessment tools known as standards-referenced or criterion-referenced tests. These tests are directly tied to the content covered in the standards-based instruction curriculum and are used to assess students' mastery of that standardized content.

Advocacy of Standardized High-Stakes Tests

Stakeholders (parents, administrators, and policy makers) hold educational systems accountable for the responsibilities with which they have been entrusted. Educators needed to create a way to measure success across a wide, diverse population. Aligning standards and assessments is seen as a plausible method of achieving that goal. The RAND Corporation (2000) found that reconfiguring standards to link to assessment and demanding accountability provided substantial benefits academically to students in Texas and North Carolina and at least some benefit to many other states.

High-stakes testing is a reaction to the criticism of the performance of our public education institutions. One means of increasing accountability is standardized testing. Wiggins (1989) remarks that, “Mass assessment resulted from legitimate concern about the failure of schools to set clear, justifiable, and consistent standards to which it would hold its graduates and teachers accountable” (p. 703).

Arguments Against High-Stakes Standardized Tests

Some individuals and organizations argue that the use of standardized tests produces unintended consequences. Many assert that teachers and administrators are under so much pressure to have their students pass the standardized tests that their entire instructional plan is altered and not for the better (Popham, 2001). The phrase “teaching to the test” is often used to describe how teachers abandon strategies that foster higher order thinking skills in favor of a narrow curriculum designed to prepare students to simply pass the standardized tests. This narrow curriculum consists of rote memorization of limited vocabulary, a narrow set of test-taking skills, and practicing answering model questions based on versions of the tests and commercially produced test preparation

material (Cancoy & Tut, 2005). Research by Kober (2002) has found that teaching to the test raises test scores without increasing content knowledge or the skills of students in the subject being tested.

The Florida Comprehensive Assessment Test

According to the Florida Department of Education (2004), the FCAT is part of Florida's overall plan to increase student achievement by implementing higher standards. The Florida Commission on Education Reform and Accountability was instituted during the 1970s to recommend ways to assess student learning, and it intended to raise academic achievement. The Florida State Board of Education adopted, and the Florida Legislature mandated, the commission's recommendations to begin statewide testing in Grades 3, 5, 8, and 11. These assessments eventually became known as the Comprehensive Assessment Design. The assessments were given for reading, mathematics, creative thought, writing, and critical thinking.

The Florida State Board of Education also developed educational content standards that became known as the Sunshine State Standards. These standards clarified the expectations of students at every grade level. Each standard was divided into benchmarks (FLDOE, 2004).

The FCAT was created to align with the Comprehensive Assessment Design and Sunshine State Standards, and it consists of two components: A criterion-referenced test and a norm-referenced test. The criterion-referenced test assesses mathematics, reading, science, and writing skills; the norm-referenced test assesses student performance compared to national norms. The FCAT is one component of the state's overall assessment of a school's performance. Other components include (a) dropout rate, (b)

attendance, (c) graduation rate, (d) discipline data, and (e) student preparation for college (Curda et al., 2005).

School Level

In this study, the term *school level* refers to the three school-level groupings as defined by Palm Beach County Schools: elementary (kindergarten through fifth grade), middle school (sixth through eighth grade), and high school (ninth through twelfth grade). Previous research has been undertaken at all three levels, providing various results. Reports from these studies have identified that programs designed to affect school climate have the most success at the elementary level and increasingly declining effectiveness throughout higher grade levels (Bransford & Darling-Hammond, 2005; Trickett, 1978). Understanding any relationship between school grade level and school climate may be important.

Conclusions

Many conclusions can be drawn from the studies examined in this review of the literature. It can be noted that there is a great deal of agreement among these researchers that academic achievement is affected by issues related to (a) administrative leadership, (b) social and interpersonal interaction, (c) civic awareness/democratic values, and (d) confidence in school-site factors. The studies profiled in this review indicate that schools exhibiting positive characteristics of each of these climate traits have a climate more conducive to learning and therefore achieve higher academic success. Schools that exhibit negative characteristics in these four categories have a climate less conducive to academic success and as a result, achievement is negatively affected.

CHAPTER 3

METHODS AND PROCEDURES

The information contained in this chapter highlights the methodology used to answer the research questions posed by this study as well as the methods used to test the hypotheses. Once the procedures were approved, a written application was submitted to the Institutional Review Board at Florida Atlantic University. Upon IRB approval, the study was initiated. This chapter includes sections devoted to this study's (a) Purpose, (b) Research Design, (c) Criterion Variables, (d) Predictor Variables, (e) Research Questions, (f) Subjects, (g) Instruments, (h) Data Collection, (i) Ethical Considerations, and (j) Data Analyses.

Purpose of This Study

The purpose of this study was to determine if there is a relationship between the criterion and predictor variables. The six research questions sought to examine if FCAT Math and FCAT Reading scores of Palm Beach County Schools could be predicted by the scores recorded on the SEQ:TV climate survey's seven climate dimensions. The seven dimensions on the SEQ:Teacher/ Staff version are: Instructional Leadership, Clear and Focused Mission, Positive School Climate, High Expectations, Frequent Monitoring of Student Progress, Time on Task, and Positive Home/School Relations. By using multiple regression analysis at the three levels; elementary, middle and high school, this study provided answers to whether any relationships exist at any or all of those levels.

This research was conducted to determine if school levels produce any differences in the predictability of measuring FCAT scores from school climate.

Research Design

This research project made use of correlational and statistical descriptive analyses. The design used an explanatory multiple regression model to measure any relationship between FCAT Reading and Math scores and the seven dimensions of the SEQ:TV survey. All suppositions made regarding the influences of the predictor variables on the criterion variables were a direct result of the analyses of the non-random archival data. All analyses were done by school level. Each multiple regression analysis grouped all elementary, middle and high schools into the three respective groups. Each analysis yielded its own descriptive statistics.

Statistical analyses were done using Social Package for Social Sciences (SPSS) statistical analysis software version 17.0. Multiple Correlation was run to assess the relationship between the predictor and criterion variables. R , R^2 and Adjusted R^2 analysis was done to test for any relationship between the criterion and predictor variables.

Criterion and Predictor Variables

The criterion variables were the FCAT Math and Reading scores of Palm Beach County Schools students for the 2007-2008 school year. The predictor variables were the seven dimensions measured on the School Effectiveness Questionnaire administered by Palm Beach County Schools for the 2007-2008 school year. These variables include (a) Instructional Leadership, (b) Clear and Focused Mission (c) Positive School Climate, (d) High Expectations (e) Frequent Monitoring of Student Progress, (f) Time on Task, and (g) Positive Home/School Relations.

Research Questions

1. Are the school climate scores from the seven dimensions on the SEQ:TV (Instructional Leadership, Clear and Focused Mission, Positive School Climate, High Expectations, Frequent Monitoring of Student Progress, Time on Task, and Positive School/Home Relations) related to FCAT Math scores at the elementary school level?
2. Are the school climate scores from the seven dimensions on the SEQ:TV related to FCAT Math scores at the middle school level?
3. Are the school climate scores from the seven dimensions on the SEQ:TV related to FCAT Math scores at the high school level?
4. Are the school climate scores from the seven dimensions on the SEQ:TV related to FCAT Reading scores at the elementary school level?
5. Are the school climate scores from the seven dimensions on the SEQ:TV related to FCAT Reading scores at the middle school level?
6. Are the school climate scores from the seven dimensions on the SEQ:TV related to FCAT Reading scores at the high school level?

Subjects

The units of study were individual elementary, middle and high schools from the district where the study was performed. This study examined 100 elementary schools, 30 middle schools and 22 high schools. The schools in the study were all of those that participated in the SEQ:TV survey for the year 2007-2008. Every Florida school is mandated by the Florida Department of Education to yearly produce data related to its climate. Florida schools may choose to create their own data collection instrument, use commercially produced instruments or use the SEQ:TV Surveys provided by Palm Beach

County Schools. According to the Department of Research and Evaluation some schools want to do a more targeted survey and created their own versions. There was no published data available as to why schools did or did not use the SEQ:TV Survey (G. Rovinelli, personal communication, March 3, 2009). To maintain consistency in the analysis, only the schools using the districts provided SEQ:TV survey were included in this study. The plan was to access the largest pool of subjects possible to give the study the greatest statistical power possible. Of the 124 elementary schools reported to have taken the FCAT, 100 also participated in the SEQ:TV survey. Of the 55 middle schools reported to have taken the FCAT, 30 participated in the SEQ:TV survey. Of the 36 high schools reported to have taken the FCAT, 22 participated in the SEQ:TV survey.

Palm Beach County Schools

The subjects of this research project were elementary, middle, and high schools located in Palm Beach County, Florida. The following facts about Palm Beach County Schools were obtained from http://www.palmbeachschools.org/PDFs/Just_the_Facts.pdf:

Facts Related to Palm Beach County Schools

At the time of this study, there are 184 public schools in Palm Beach.

The Department of Exceptional Student Education (ESE) assists the schools by providing a free and appropriate public education for all students with disabilities, ages 3-21. There are 33,562 students in all ESE programs. This includes 7,507 students in the Gifted program. Many of these ESE students are mainstreamed into regular classes.

There are 27 community schools plus one Virtual Community School providing on-line instruction. The Adult Education Center provides Adult and Community

Education programs to thousands of county residents each year. In 2007, 1,660 residents earned their GED in these programs.

At the time of this study, 15,056 (excludes new KG or 12th graders who have graduated) students are in English for Speakers of Other Languages (ESOL) classes. There are 149 languages and dialects spoken; ESOL classes are also held for adults.

After School Enrichment Programs are provided for 16,500 students in 94 schools, 3,400 students in 35 middle schools, and 15 Beacon Centers. Summer Camps are provided in over 40 of the schools during the summer months.

The PBC School District has 39,958 computers (5 years or newer) available to teachers and students arranged in a combination of networked computer labs, distributed workstations and standalone computers.

At the time of this study, Palm Beach County is the 5th largest school district in Florida and the 11th largest in the nation with 168,342 students (K-12).

PBC school grades are among the highest in the state with 104 schools earning A's, 25 schools earning B's, and 25 schools earning C's (excluding Charter Schools).

The School District of Palm Beach County has earned an "A" rating from the Florida Department of Education for the fourth consecutive year based on student performance on the FCAT.

The District had 35 Charter Schools as of July 2008.

The Home Education Office registered and ensured statutory compliance for approximately 4,252 students in FY08. The program continues to lead the state in size and students qualifying for Bright Futures scholarships.

There are 155 Choice Programs which include magnets, career academies and choice schools and programs in 63 elementary, middle, and high schools throughout the county. Over 32,000 students participate yearly.

Community volunteers (35,120) provided academic assistance to students through the Volunteers in Public Schools (VIPS) program. There are 515 business partners offering resources to increase academic achievement.

Seventy-two teachers earned National Board Certification during the 2007-2008 school year, bringing the District's total number of nationally certified teachers to 569.

Academically, PBC Schools continue to lead nationally, according to *Newsweek* magazine—The Top of the Class—1,200 Top U.S. Schools (2008). Suncoast High School is the Top High School in Florida and the Top High School in the entire Eastern U.S. Three PBC County schools are in the top 100 high schools in America—Suncoast High School, Alexander W. Dreyfoos Jr. School of the Arts, and Atlantic Community High School. Five PBC schools are in the top 5% nationwide.

Palm Beach County Schools Demographic Information

The following statistical information was obtained from the Gold Report (n.d.) website.

Table 1

Demographic Make-up of Palm Beach County Schools 2007 School Year

| | Grade | Time FRAME | TOTAL % | Total Students | WHITE % | WHITE Total | BLACK % | BLACK Students | HISP % | HISP Students | MALE % | MALE Student | FEMALE % | FEMALE Students | |
|----|-----------|------------|---------|----------------|---------|-------------|---------|----------------|--------|---------------|--------|--------------|----------|-----------------|-------|
| | TOTAL# | K-5 | 2007 | 100 | 76913 | 37 | 28798 | 28 | 21754 | 26 | 19713 | 52 | 39907 | 48 | 37006 |
| | TOTAL# | 6-8 | 2007 | 100 | 38439 | 41 | 15696 | 28 | 10848 | 23 | 8894 | 52 | 19825 | 48 | 18614 |
| | TOTAL# | 9-12 | 2007 | 100 | 53570 | 43 | 23252 | 29 | 15539 | 21 | 11274 | 51 | 27178 | 49 | 26392 |
| 45 | F/R LUNCH | K-5 | 2007 | 51 | 39088 | 18 | 5112 | 80 | 17464 | 71 | 13933 | 51 | 20314 | 51 | 18774 |
| | F/R LUNCH | 6-8 | 2007 | 43 | 16443 | 15 | 2413 | 71 | 7688 | 60 | 5370 | 43 | 8603 | 42 | 7840 |
| | F/R LUNCH | 9-12 | 2007 | 30 | 16261 | 9 | 2176 | 54 | 8325 | 44 | 4947 | 31 | 8351 | 30 | 7910 |
| | LEP | K-5 | 2007 | 17 | 13048 | 2 | 536 | 16 | 3448 | 43 | 8381 | 17 | 6934 | 17 | 6114 |
| | LEP | 6-8 | 2007 | 5 | 1910 | 1 | 86 | 6 | 679 | 12 | 1070 | 5 | 1001 | 5 | 909 |
| | LEP | 9-12 | 2007 | 6 | 3446 | 1 | 135 | 11 | 1694 | 13 | 1477 | 7 | 1806 | 6 | 1640 |
| | ESE | K-5 | 2007 | 15 | 11853 | 16 | 4643 | 15 | 3324 | 16 | 3064 | 21 | 8188 | 10 | 3665 |
| | ESE | 6-8 | 2007 | 16 | 5988 | 15 | 2277 | 19 | 2018 | 15 | 1377 | 20 | 4031 | 11 | 1957 |

(table continues)

Table 1 (continued)

| | Grade | Time FRAME | TOTAL % | Total Students | WHITE % | WHITE Total | BLACK % | BLACK Students | HISP % | HISP Students | MALE % | MALE Student | FEMALE % | FEMALE Students |
|--------|-------|------------|---------|----------------|---------|-------------|---------|----------------|--------|---------------|--------|--------------|----------|-----------------|
| ESE | 9-12 | 2007 | 14 | 7262 | 12 | 2898 | 17 | 2610 | 13 | 1469 | 18 | 4863 | 9 | 2399 |
| GIFTED | K-5 | 2007 | 7 | 5185 | 12 | 3473 | 2 | 451 | 3 | 552 | 6 | 2581 | 7 | 2604 |
| GIFTED | 6-8 | 2007 | 9 | 3302 | 13 | 2052 | 4 | 395 | 5 | 435 | 8 | 1649 | 9 | 1653 |
| GIFTED | 9-12 | 2007 | 5 | 2887 | 8 | 1801 | 2 | 367 | 4 | 399 | 5 | 1427 | 6 | 1460 |

Additional demographic information is contained in a table found in Appendix A. This table contains additional data related to Palm Beach County Schools. It contains the percentages of minority students, percentages of students accessing free and reduced lunches, percentage of out of school suspensions, and percentage of gifted students.

Free and Reduced Price Lunches

It may be noted that according to the statistics cited in the *Palm Beach County Schools Demographic Information* section of this chapter, the Black and Hispanic populations of Palm Beach County Schools at all grade levels have a higher percentage of students receiving free and reduced lunches. According to a report published by the Florida Department of Education, there are specific criteria that must be met to qualify for free or reduced payment for school lunches and breakfasts (FLDOE, 2004b).

In 1946, The National School Lunch Program was developed. It was established as a result of the passing of the National School Lunch Act. It was designed to provide lunches to school children from economically disadvantaged families at reduced prices or no cost at all, depending on the economic need of the family. The National School Lunch Program is active in all 50 states, the District of Columbia, Guam, Puerto Rico, the U.S. Virgin Islands, and Department of Defense schools. The United States Department of Agriculture annually publishes income guidelines for eligibility. The guidelines consider factors such as household income and family size. These factors are compared to federal poverty guidelines. For example, individuals coming from a four-person household in Florida with an annual household income less than \$24,505 would qualify for free lunches (FLDOE, 2004c).

Socioeconomic Status and Academic Achievement of Palm Beach County Students

According to many published works, socio-economic status (SES) has an effect on student achievement (Banks, 2004; Ferguson & Mehta, 2004; Freire, 2000; Haycock & Peske, 2006; Ladson-Billings, 2006). According to these reports, students coming from a family with low socio-economic status have a greater likelihood to perform at lower

academic levels than students from higher economically established families. As noted in the *Palm Beach County Schools Demographic Information* section of this chapter, Black and Hispanic students make up 54% of PBC Schools' elementary students, 51% of the middle school students, and 50% of high school students. There is a range of 54% to 80% of Black students and 44% to 71% of Hispanic students receiving free/and or reduced price lunches (FLDOE, 2007). For this reason, SES may need to be accounted for as a possible factor when looking at any relationship between a school's climate and student academic achievement.

Instruments

The data used to determine if a relationship exists between academic achievement and school climate were the Palm Beach County Schools' FCAT scores and the scores of their SEQ:TV surveys from the 2007-2008 school year. The scores for FCAT Reading and Math (dependant variable) were used to measure academic achievement. The scores from the SEQ:TV surveys (predictor variable) were used to measure school climate.

The School Effectiveness Questionnaire: Teacher Version

The SEQ:TV survey was adapted by the School District of Palm Beach County from a survey developed by the Orange County, Florida School District to measure effective school correlates. It adheres to the Florida Department of Education guidelines for collecting data annually on the climate of every school in Florida. The survey uses a Likert- type scale with a value ranging from 1 to 5. The range measures agreement or disagreement to the 67 statements contained on the SEQ:TV survey. One represents strong disagreement and 5 represents strong agreement. The questions fall in to seven

dimensions of climate (School District of Palm Beach County, 2007). These seven dimensions are the predictor variables in the multiple regression statistical analyses.

Palm Beach County has determined that these seven dimensions together create a school's climate. The seven dimensions on the Teacher/ Staff version are: (a) Instructional Leadership; (b) Clear and Focused Mission; (c) Positive School Climate; (d) High Expectations; (e) Frequent Monitoring of Student Progress; (f) Time on Task; and (g) Positive Home/School Relations. According to the school district's Department of Research and Evaluation, no formal reliability studies have been conducted. The Department of Research and Evaluation stated that as the survey was implemented, patterns emerged that led them to create the seven dimensions and to create the item correlates that are currently used.

According to the Palm Beach County Schools Department of Research, no reliability studies have been done (G. Rovinelli, personal communication, March 3, 2009). Of the 124 elementary schools reported as taking the FCAT, 100 also participated in taking the SEQ:TV survey for the 2007-2008 school year. Of the 55 middle schools reported as taking the FCAT, 30 also participated in taking the SEQ:TV survey. Of the 36 high schools reported as taking the FCAT, 22 also participated in taking the SEQ:TV survey. A copy of the SEQ:TV Items can be found in Appendix B.

Florida Comprehensive Assessment Test

Students are given the FCAT to measure their mastery of the skills articulated in the Florida Sunshine State Standards. Students in grades 3-10 take the FCAT including limited English proficient (LEP) and exceptional education (ESE) students. At the request of parents, home-schooled students may take the FCAT.

The areas assessed on the FCAT include Reading, Writing, Mathematics, and Science. FCAT Reading and Mathematics scores are reported using 3 categories. These categories include Scale Score, Achievement Level and Developmental Scale Score. The scale scores are divided into five categories termed Achievement Levels. The lowest achievement level is 1 and the highest is 5. The scale scores for each subject and grade level are scored on a scale from 100 to 500. A student scoring near 300 or above is considered achieving on or above grade level.

Data Collection

After the IRB approval was obtained, the collection of data was initiated. The FCAT scores are public record and were obtained from the Florida Department of Education website. This study used FCAT Reading and Math Mean Scale Scores for grades three through ten for the academic year of 2007-2008. The Florida Department of Education posts FCAT Reading and Math test results by grade level for every Palm Beach County School. The data fields include grade level, district number, school number, school name, number of students that took the test that year at that grade level, mean developmental scale score, mean scale score, percentage of students in each achievement level, percentage in achievement levels of 3 and above, mean points earned by content area and results for students matched to previous year.

The SEQ:TV climate survey scores were requested and subsequently provided by the Department of Research for Palm Beach County Schools. The SEQ:TV data are reported in several formats. They include the SEQ Multi-Year School List and SEQ School List. For the purpose of this study, the SEQ School List was used. There are three versions of this report. Elementary schools, middle schools, and high schools are

segregated into their own individual reports that in turn report the scores for each individual school. This report provides data fields that include (a) school name and number, (b) number of respondents, (c) mean correlations of the seven climate dimensions, and (d) the total mean score.

The FCAT scores and SEQ:TV data were merged into three Microsoft Access databases as tables. One database was for elementary schools, one for middle schools and one for high schools. The decision was made to calculate the weighted means for FCAT Math and Reading scale scores for every school in the study for the purpose of providing the most accurate depiction of each school's scale scores. To get the weighted mean scale scores for each school, a formula was used. The formula can be found in Appendix C. The mean scale score for each individual grade that took the test at that school was multiplied by the number of students at that grade level that took that test. The sum of the products for each grade level that took the test at that school was added together and divided by the sum of all of the students that took the test at that school. Queries were then developed to run the data in the Access database. Once these calculations were run, the Access queries saved as tables were converted to Excel spreadsheets. These spreadsheets were then imported in to SPSS version 17 for statistical analysis. A check for outliers was done. There were no schools that had FCAT or SEQ:TV scores that were more than 3 Standard Deviations from their respective means. For that reason, all data collected were used in the study.

Ethical Considerations

School mean scores were used as criterion and predictor variable values. No schools are identifiable in the reporting of these data analyses. Additionally, no individual

student information was used or exposed in this study. As explained in the Subjects section, all schools participating in the SEQ:TV survey do so voluntarily. The surveys are done anonymously. This aids in following the IRB demand to “do no harm” to the participants.

Data Analyses

In order to test the study’s hypotheses, a linear multiple regression model using SPSS software was run for the elementary, middle, and high schools included in this study. The relationships of individual predictors with the criterion were tested with correlations and the model, including all seven predictors, was tested with multiple regressions. An alpha value of .05 was set to judge the *p*-values.

Chapter Summary

After the research topic was determined and background information was gathered, research questions were developed. A method for testing the research questions and hypotheses was crafted. Appropriate subjects and instruments were selected to adequately complete the research. The statistical analysis most effective for answering the research questions related to this study was chosen. Based on that decision, the appropriate statistical analysis software was chosen. After the basic structure of the study was in place, the appropriate institutions were notified, permissions for research applied for, and subsequently granted. At that point, this research project was initiated.

CHAPTER 4

ANALYSIS OF DATA

The findings of this study have been included in this chapter. A summary of the analyses performed on the data obtained for this study has been presented. Additionally, the research questions posed in this study were answered.

One of the stated objectives of this study was to determine if knowing the climate of the individual Palm Beach County Schools as measured by the SEQ:TV climate survey can allow for statistically significant predictions of FCAT Reading and FCAT Math scores. The statistical analysis software Social Package for Social Sciences (SPSS) version 17.0 was utilized to accomplish the analysis of the data. This study used the Linear Regression Model statistical analysis method, the most appropriate for this type of study. The forced entry multiple regression method was utilized. The results of the SPSS tests run are reported in the form of Descriptive Statistics, Model Summary, Correlations Analysis, Analysis of Variance and Coefficients Tables.

Six SPSS multiple regression analyses were executed to test for any relationships between the FCAT scores and the SEQ:TV scores of the schools in this study. FCAT Math and FCAT Reading scores were analyzed at the elementary, middle and high school level.

Description of the Subjects

The study sample comprised 100 elementary schools, 30 middle schools and 22 high schools. The schools in the study are all of those that participated in the Palm Beach

scores and the seven climate dimensions for the elementary, middle, and high school levels. Tables 5 through 7 contain intercorrelational matrices for the same variables at the elementary, middle, and high school levels.

Table 2

Means and Standard Deviations of the 2007 SEQ:TV Scores and Elementary FCAT

| | Mean | Std. Deviation |
|----------------|----------|----------------|
| FCAT Math | 327.5900 | 22.29513 |
| FCAT Read | 308.7600 | 23.76999 |
| Inst Lead | 4.1060 | .34781 |
| Pos Ho Sch Rel | 3.9290 | .45088 |
| TO Task | 4.1560 | .30955 |
| FM Stu Prog | 4.3500 | .24267 |
| Hi Exp | 4.2890 | .29332 |
| Pos Sch Clim | 4.0110 | .35729 |
| Cle Foc Mis | 4.2480 | .29524 |

N = 100

Table 3

Means and Standard Deviations of the 2007 SEQ Scores and Middle School FCAT

| | Mean | Std. Deviation |
|----------------|----------|----------------|
| FCAT Math | 316.9000 | 21.49956 |
| FCAT Read | 308.5000 | 22.62246 |
| Inst Lead | 3.7833 | .35143 |
| Pos Ho Sch Rel | 3.6600 | .37655 |
| TO Task | 3.8167 | .32704 |
| FM Stu Prog | 4.1000 | .23489 |
| Hi Exp | 3.9933 | .31287 |
| Pos Sch Clim | 3.6600 | .36351 |
| Cle Foc Mis | 3.9300 | .26801 |

N = 30

Table 4

Means and Standard Deviations of the 2007 SEQ Scores and High School FCAT

| | Mean | Std. Deviation |
|----------------|----------|----------------|
| FCAT Math | 319.0909 | 21.35618 |
| FCAT Read | 309.0455 | 26.90809 |
| Inst Lead | 3.8455 | .33626 |
| Pos Ho Sch Rel | 3.7364 | .40420 |
| TO Task | 3.9182 | .31417 |
| FM Stu Prog | 4.1636 | .24013 |
| Hi Exp | 4.0727 | .31348 |
| Pos Sch Clim | 3.7727 | .36927 |
| Cle Foc Mis | 3.9955 | .28864 |

N = 22

Table 5

Correlations Among SEQ and FCAT Scores for Elementary Schools

| | FCAT Math | Cle Foc Mis | Inst Lead | Pos Ho Sch Rel | TO Task | FM Stu Prog | Hi Exp | Pos Sch Clim | FCAT Read |
|----------------|--------------|-------------------|--------------|----------------------|------------|-------------------|-----------|--------------------|--------------|
| FCAT Math | 1.000 | .496* | .340* | .685* | .538* | .501* | .463* | .501* | .964 |
| Cle Foc Mis | .496* | 1.000 | .929 | .856 | .916 | .939 | .931 | .902 | .440* |
| Inst Lead | .340* | .929 | 1.000 | .827 | .871 | .870 | .918 | .896 | .303* |
| Pos Ho Sch Rel | .685* | .856 | .827 | 1.000 | .877 | .839 | .840 | .905 | .669* |
| TO Task | .538* | .916 | .871 | .877 | 1.000 | .947 | .921 | .941 | .484* |
| FM Stu Prog | .501* | .939 | .870 | .839 | .947 | 1.000 | .934 | .902 | .442* |
| Hi Exp | .463* | .931 | .918 | .840 | .921 | .934 | 1.000 | .918 | .402* |
| Pos Sch Clim | .501* | .902 | .896 | .905 | .941 | .902 | .918 | 1.000 | .455* |
| FCAT Read | .964 | .440* | .303* | .669* | .484* | .442* | .402* | .455* | 1.000 |

$N = 100$ * $p < .05$

Table 6

Correlations Among SEQ and FCAT Scores for Middle Schools

| | FCAT Math | Cle Foc Mis | Inst Lead | Pos Ho Sch Rel | TO Task | FM Stu Prog | Hi Exp | Pos Sch Clim | FCAT Read |
|----------------|--------------|-------------------|--------------|----------------------|------------|-------------------|-----------|--------------------|--------------|
| FCAT Math | 1.000 | .148 | .079 | .571* | .346 | .377* | .278 | .330 | .982 |
| Cle Foc Mis | .148 | 1.000 | .932 | .764 | .856 | .887 | .899 | .901 | .181 |
| Inst Lead | .079 | .932 | 1.000 | .758 | .849 | .840 | .883 | .899 | .093 |
| Pos Ho Sch Rel | .571* | .764 | .758 | 1.000 | .815 | .807 | .817 | .834 | .606* |
| TO Task | .346 | .856 | .849 | .815 | 1.000 | .916 | .914 | .951 | .352 |
| FM Stu Prog | .377* | .887 | .840 | .807 | .916 | 1.000 | .929 | .925 | .380* |
| Hi Exp | .278 | .899 | .883 | .817 | .914 | .929 | 1.000 | .931 | .278 |
| Pos Sch Clim | .330 | .901 | .899 | .834 | .951 | .925 | .931 | 1.000 | .335 |
| FCAT Read | .982 | .181 | .093 | .606* | .352 | .380* | .278 | .335 | 1.000 |

$N = 30$ * $p < .05$

Table 7

Correlations Among SEQ and FCAT Scores for High Schools

| | FCAT Math | Cle Foc Mis | Inst Lead | Pos Sch Rel | Ho Rel | TO Task | FM Stu Prog | Hi Exp | Pos Sch Clim | FCAT Read |
|----------------|--------------|-------------------|--------------|-------------------|-----------|------------|-------------------|-----------|--------------------|--------------|
| FCAT Math | 1.000 | .431* | .429* | .712* | .453* | .459* | .592* | .537* | .988 | |
| Cle Foc Mis | .431* | 1.000 | .964 | .895 | .946 | .959 | .946 | .950 | .402 | |
| Inst Lead | .429* | .964 | 1.000 | .870 | .934 | .947 | .966 | .958 | .386 | |
| Pos Ho Sch Rel | .712* | .895 | .870 | 1.000 | .891 | .897 | .921 | .923 | .691* | |
| TO Task | .453* | .946 | .934 | .891 | 1.000 | .956 | .934 | .936 | .427* | |
| FM Stu Prog | .459* | .959 | .947 | .897 | .956 | 1.000 | .954 | .944 | .422 | |
| Hi Exp | .592* | .946 | .966 | .921 | .934 | .954 | 1.000 | .968 | .561* | |
| Pos Sch Clim | .537* | .950 | .958 | .923 | .936 | .944 | .968 | 1.000 | .508* | |
| FCAT Read | .988 | .402 | .386 | .691* | .427* | .422 | .561* | .508* | 1.000 | |

N = 22 *p < .05

Research Question 1

Are the school climate scores from the seven dimensions on the SEQ:TV (Instructional Leadership, Clear and Focused Mission, Positive School Climate, High Expectations, Frequent Monitoring of Student Progress, Time on Task and Positive School/Home Relations) related to FCAT Math scores at the elementary school level?

Findings

Referring to Table 5, it can be noted that all SEQ scores are significantly and positively related to elementary FCAT Math mean scale scores. This model predicting FCAT elementary school Math mean scores (criterion variable) from Positive School Climate, High Expectations, Frequent Monitoring Student Progress, Time On Task, Positive Home- School Relationship, Instructional Leadership and Clear and Focused

Mission (predictor variables) was significant, $F(7, 92) = 29.367$, $p < .05$ with an R^2 of .691 and an Adjusted R^2 of .667. H_{01} can be rejected.

Research Question 2

Are the school climate scores from the seven dimensions on the SEQ:TV related to FCAT Math scores at the middle school level?

Findings

The data contained in Table 6 indicate that only Frequent Monitoring of Student Progress and Positive Home/School Relations are significant and positively related to mean FCAT Math mean scale scores at the middle school level. This model predicting FCAT middle school math mean scores (criterion variable) from the predictor variables was significant, $F(7, 22) = 7.398$, $p < .05$ with an R^2 of .702 and an Adjusted R^2 of .607. H_{02} can be rejected at the middle school level.

Research Question 3

Are the school climate scores from the seven dimensions on the SEQ:TV related to FCAT Math scores at the high school level?

Findings

Reading the data contained in Table 7, it can be noted that all SEQ scores are significantly and positively related to high school FCAT Math mean scale scores. This model predicting FCAT high school math mean scores (criterion variable) from the predictor variables was significant, $F(7, 14) = 11.339$, $p < .05$ with an R^2 of .850 and an Adjusted R^2 of .775. H_{03} can be rejected at the high school level.

Research Question 4

Are the school climate scores from the seven dimensions on the SEQ:TV related to FCAT Reading scores at the elementary school level?

Findings

The data contained in Table 5, indicate all SEQ scores are significantly and positively related to elementary FCAT Reading mean scale scores. This model predicting FCAT elementary school Reading mean scores (criterion variable) from the predictor variables was significant, $F(7, 92) = 28.43$, $p < .05$ with an R^2 of .684 and an Adjusted R^2 of .660. H_{04} can be rejected at the elementary level.

Research Question 5

Are the school climate scores from the seven dimensions on the SEQ:TV related to FCAT Reading scores at the middle school level?

Findings

The data contained in Table 6 indicate that only Frequent Monitoring of Student Progress and Positive Home/School Relations SEQ scores are significantly and positively related to middle school FCAT Reading mean scale scores. This model predicting FCAT middle school reading mean scores (criterion variable) from the predictor variables was significant, $F(7, 22) = 9.058$, $p < .05$ with an R^2 of .742 and an Adjusted R^2 of .660. H_{05} can be rejected at the middle school level.

Research Question 6

Are the school climate scores from the seven dimensions on the SEQ:TV related to FCAT Reading scores at the high school level?

Findings

The data in Table 7 indicate that Positive School Climate, Frequent Monitoring of Student Progress, Time on Task, and Positive Home/School Relations SEQ scores are significantly and positively related to high school FCAT Reading mean scale scores. This model predicting FCAT high school reading mean scores (criterion variable) from the predictor variables was significant, $F(7, 14) = 13.729$, $p < .05$ with an R^2 of .873 and an Adjusted R^2 of .809. H_{06} can be rejected at the high school level.

Conclusions

The models for predicting FCAT scores are significant at the elementary, middle, and high school levels. Based on the data obtained by this study, it can be determined that school climate scores from the seven dimensions on the SEQ:TV (Instructional Leadership, Clear and Focused Mission, Positive School Climate, High Expectations, Frequent Monitoring of Student Progress, Time on Task and Positive School/Home Relations) provide varying degrees of significance and therefore varying ability to predict the criterion at the elementary, middle and high school levels. All seven climate dimensions are significant and positively related to elementary Math, high school Math, and elementary Reading FCAT scale scores. Frequent Monitoring of Student Progress and Positive Home/School Relations are significant and positively related to mean FCAT Math and FCAT Reading mean scale scores at the middle school level. Positive School Climate, Frequent Monitoring of Student Progress, Time on Task, and Positive Home/School Relations SEQ scores are significantly and positively related to high school FCAT Reading mean scale scores. The climate dimension with the largest effect size and most consistent significance was Positive Home/School Relations. Additionally, the

models for this study have very large effect sizes. These models had a range of 68% to 87.3% ability to predict FCAT Reading scores and a range of 69.1% to 85% ability to predict FCAT Math scores.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The value of this or any study of education ought to be assessed by its contribution to the mission of those seeking to improve the educational experiences of the students, teachers, administrators, parents, community members, and all those with a stake in this very complex process of educational research. One purpose of this chapter is to offer analysis of the findings of this study. Other goals for this chapter are to articulate conclusions about the data produced during the process of answering this study's research questions and examine that data in the context of how it may benefit stakeholders in education. Finally, this chapter contains recommendations for educational stakeholders based on the information gathered during the course of this study.

The stakeholders in education today rely heavily upon standardized tests to direct policy. Using a standardized test in the form of the FCAT as the criterion variables in this study benefits the stakeholders by offering analyses in context and directly relevant to the form of assessment they were mandated to use. The federal government, school district, and the state in which the schools in this study operate put an extraordinary emphasis on test scores (United States Department of Education, 2004). These scores drive curriculum decisions, instructional design, funding, staffing, and other policy decisions. These mandates and policies that drive the use of standardized tests are such a part of the educational landscape, that the phrase "teaching to the test," has become a part of the education lexicon (Amrein & Berliner, 2002; Cancoy & Tut, 2005; O'Neil, 1992;

Popham, 2001), especially in Florida public schools with the administration of FCAT (FLDOE, 2004). This is the context in which these schools must function.

As a part of the analysis in this chapter, schools scoring above or below 1 Standard Deviation from the mean FCAT score at their respective grade level were identified as under or over-achieving schools. It has been noted that these schools have been scrutinized by the stakeholders at all grade levels. Remedies are constantly being sought for failing schools and the replication of the success of high achieving schools is continually being attempted to bring low achieving schools to a higher academic status. As such, these schools at the polar ends of the achievement scale garner a great deal of attention and play a big part in the discussion of academic achievement.

During the process of determining the focal point of this study, many compelling issues facing educators were considered as important to address. One of these issues was school climate. The principal criterion for choosing school climate for examination in this study was the mounting evidence that it may be a key factor in the academic success or failure of schools. The design of this study is tailored to measure any relationship between school climate and academic achievement. As the data gained through this study is analyzed, it can be determined that proper understanding and treatment of school climate may offer solutions to some of the challenges facing educators.

In the development stage of this study one fundamental question emerged as the most important question to be answered. Why do some schools in the same district working under the same political, curricular, and budgetary structure fail while others succeed? This discrepancy in academic achievement is the underlying issue assessed by this study. Many of the studies included in the literature review contained in Chapter 2

not only offered answers to some questions related to academic achievement, but raised others.

Though most published studies from the literature have focused on one dimension of climate, this study expands the research to assess the relationships of seven climate dimensions with academic achievement. The significance of the model to predict FCAT scores from climate scores collectively was determined while the correlations matrices measured for possible relationships between multiple variables. Additionally, this study measured the relationship at the elementary, middle, and high school levels. It should be stated that the school level measures were done as independent analyses without testing for any moderation effect.

A fair question might be “Why would understanding the relationship between school climate and FCAT scores be important to schools?” The knowledge gained in this study is valuable for several reasons. First, the schools in this study were measured for any relationship or correlation to a standardized test. In this case, it was the valued measure, FCAT scores. This research project measures the relationship between seven separate climate dimensions and FCAT Math and Reading for every individual school in the study and makes that data available to stakeholders or future researchers (Appendix D). The second valuable aspect of this study is that a diverse population of students and schools were examined on all seven dimensions. An in-depth analysis of the demographic make-up of the school district from which this study population was selected is in Chapter 3. An examination of that data reveals a diverse population. The 152 schools included in this study cross many (a) socio-economic and racial groups, (b) student and staff population demographics, (c) leadership styles, (d) school mission plans, and (e)

geographic lines. All of these schools are in the same school district and therefore are working under the same policies. Having all of the schools from the same district eliminated additional variables due to differing policies under which the subjects were operating. Another valuable facet to this study is that elementary, middle, and high school levels were studied and the results will be made available to stakeholders.

Summary of Findings

This study endeavored to test six hypotheses. This research project tested if a relationship existed between 2007 FCAT Math and Reading scores and the climate of schools at the elementary, middle and high school levels. Climate was measured by the seven dimensions assessed on the 2007 SEQ:TV climate survey. These dimensions include Instructional Leadership, Clear and Focused Mission, Positive School Climate, High Expectations, Frequent Monitoring of Student Progress, Time on Task and Positive School/Home Relations. There was no published research addressing the reliability of the SEQ:TV survey. This study examined 100 elementary schools, 30 middle schools and 22 high schools from the same school district. Of the 124 elementary schools reported to have taken the FCAT, 100 also participated in the SEQ:TV survey. Of the 55 middle schools reported to have taken the FCAT, 30 participated in the SEQ:TV survey. Of the 36 high schools reported to have taken the FCAT, 22 participated in the SEQ:TV survey.

Though this study uses FCAT Reading and Math as the criterion variables, the conclusions may offer insight to other educational institutions regarding the overall academic achievement of their students. For that reason this data may be of value to stakeholders. A summary of the data generated by answering each of the research questions follows below:

Research Question 1

Are the school climate scores from the seven dimensions on the SEQ:TV (Instructional Leadership, Clear and Focused Mission, Positive School Climate, High Expectations, Frequent Monitoring of Student Progress, Time on Task and Positive School/Home Relations) related to FCAT Math scores at the elementary school level?

Findings. The model for predicting FCAT Math scores at the elementary level was significant, $F(7, 92) = 29.367$, $p < .05$ with an R^2 of .691 and an Adjusted R^2 of .667. H_0 can be rejected. 69.1% of elementary FCAT Math scores can be predicted by school climate scores.

Of the 100 elementary schools included in this study, the statistical analysis determined that all seven climate factors collectively were significant predictors of student achievement as measured by FCAT Math scores at the elementary school level.

Each of the seven predictor variables was individually significant and positive. The percentage of each predictor variable's ability to predict FCAT Math at the elementary level were (a) Instructional Leadership 11%, (b) Clear and Focused Mission 24%, (c) Positive School Climate 25%, (d) High Expectations 21%, (e) Frequent Monitoring of Student Progress (25%), (f) Time on Task (29%), and (g) Positive School/Home Relations 47%.

Conclusions. The following conclusions are based on the analysis of the data collected in the process of answering Research Question 1:

1. There was a relationship between the mean climate scores and the mean FCAT Math scores at the elementary level.

2. This model indicated the very large effect size of 69.1%. This is the percentage of elementary FCAT Math scores that can be predicted by the SEQ:TV scores.

3. All seven climate dimensions are significant and positively related to FCAT scores.

An alternative way to view these data provided an additional perspective. As these data were examined, a discernable pattern emerged. The schools achieving FCAT Math scores above the mean at the elementary level were more likely to have SEQ:TV scores above the mean. The schools with FCAT Math scores below the mean were more likely to have SEQ:TV scores below the respective mean at that level.

The following data illustrated the apparent relationship that exists between the predictor variables (SEQ:TV scores) and the FCAT Math scores of schools at the elementary level (criterion variable). To demonstrate that low SEQ:TV climate scores seem to be associated with low FCAT Math scores and high SEQ:TV scores may be associated with high FCAT Math scores, the schools scoring above or below the mean SEQ:TV scores for their respective grade level were identified and examined further. Though the number of subjects for this analysis decreases from the original number being studied, decreasing statistical power, these schools are very important to policy makers for two reasons and as such, are an important part of this discussion. Schools scoring below the mean FCAT scale score for their respective level are targeted by school districts for immediate administrative and academic attention. Improving the FCAT scores of these schools becomes a top priority of the district. Multiple policies are in place to improve the FCAT scores of these schools (United States Department of

Education, 2004). Schools at the higher end of academic achievement as defined by FCAT Math scores are rewarded for their achievement.

A table containing the weighted FCAT Math mean scores and the mean SEQ:TV scores of all the elementary schools for their respective grade-level was created to help examine any possible association between low SEQ:TV, high SEQ:TV scores, low FCAT Math scores and high FCAT Math scores (Appendix A). Deviations from each mean score were highlighted using designated indicators. These indicators provided the reader with the status of the scores relative to their respective means. The indicators included “A,” which indicates that score is above the mean score at that school level. “B” indicated that score is below the mean score for that school level, and “W” indicated that score is within 1 Standard Deviation from the mean FCAT Math score at that school level. There were 43 elementary schools that had SEQ:TV scores above or below the mean SEQ:TV score for their respective grade level. To keep the schools anonymous, they were numbered 1 to 43. The following table presents the mean SEQ:TV score with the mean score status indicator and that school’s weighted mean FCAT Math scale score accompanied by the mean score status indicator:

Table 8

Mean Elementary School FCAT Math and SEQ:TV Scores With Deviation

From Mean Indicators

| School Number | Mean SEQ Score | Weighted Math Means |
|---------------|----------------|---------------------|
| 1 | 4-B | 367A |
| 2 | 3.8-B | 309W |
| 3 | 4.7-A | 373A |
| 4 | 3.9-B | 295B |
| 5 | 4.4-A | 372A |
| 6 | 4.5-A | 351A |
| 7 | 4.2-A | 353A |
| 8 | 3.7-B | 302B |
| 9 | 4.5-A | 381A |
| 10 | 3.7-B | 293B |
| 11 | 4.3-A | 316W |
| 12 | 3.4-B | 297B |
| 13 | 4.3-A | 359A |
| 14 | 3.9-B | 295B |
| 15 | 3.7-B | 297B |
| 16 | 4.6-A | 349A |
| 17 | 3.8-B | 304B |
| 18 | 4.6-A | 362A |
| 19 | 4.4-A | 360A |
| 20 | 4.1-B | 313W |
| 21 | 4.3-A | 354A |
| 22 | 3.5-B | 271B |
| 23 | 4.2-A | 355A |
| 24 | 4.2-A | 351A |
| 25 | 4.8-A | 320W |
| 26 | 3.2-B | 308W |
| 27 | 4.3-A | 297B |
| 28 | 4.2-A | 306W |
| 29 | 4.1-B | 360A |
| 30 | 3.9-B | 319W |
| 31 | 4.5-A | 304B |
| 32 | 4.4-A | 300B |
| 33 | 4.1-B | 293B |
| 34 | 4.1-B | 306W |
| 35 | 4.3-A | 298B |

(table continues)

Table 8 (continued)

| School Number | Mean SEQ Score | Weighted Math Means |
|---------------|----------------|---------------------|
| 36 | 4.4-A | 360A |
| 37 | 4.3-A | 353A |
| 38 | 4.3-A | 358A |
| 39 | 4-B | 299B |
| 40 | 4.2-A | 378A |
| 41 | 4.2-A | 301B |
| 42 | 3.2-B | 290B |
| 43 | 4.1-B | 302B |

A= above mean B= below mean, W= Within 1 Standard Deviation

A discernable pattern emerged when examining these data contained in Table 8. Of the 43 schools scoring above or below the mean SEQ:TV score for their respective grade level, 24 schools scored above the mean SEQ:TV score and 19 scored below the mean SEQ:TV score. Of the 24 scoring above the mean SEQ:TV score, 17 also scored above 1 SD of the mean FCAT Math scale score.

Of the 19 elementary schools scoring below the mean SEQ-TV score, 12 also scored below 1 SD on the FCAT Mean Math scale score. There were five schools above the mean SEQ:TV scores that scored below 1 SD on the FCAT Math test and two that were below the mean SEQ:TV score that scored above 1 SD on the FCAT Math test. Their relationships were negative. There were three schools with SEQ:TV scores above the mean that were within 1 SD and five schools scoring below the mean on the SEQ:TV survey and within 1 SD of the mean FCAT scale score.

Though further research would be required to fully understand the full extent of the meaning of these data, the following conclusions can be made:

1. A majority of the schools with SEQ-TV scores above the mean also had achievement scores not only above the mean, but fully above 1 SD of the respective mean.
2. A majority of the schools scoring below the mean SEQ:TV score also scored fully below 1 SD on the FCAT Math test.
3. At the extremes of the achievement scale, there was a positive relationship between school climate and academic achievement at the elementary level at the schools involved in this study.
4. Elementary schools with scores below the mean SEQ:TV scores may benefit from programs designed to improve school climate.

These data produced by this study linking low SEQ:TV scores to low FCAT Math scores and high SEQ:TV scores to FCAT Math scores above the mean may give stakeholders confidence in investing resources to programs that will improve school climate. Improving the school's climate may translate directly into improved FCAT Math scores at the elementary level. This information may aid stakeholders when allocating funds and developing policies.

This study provided mean scores for all seven climate dimensions as well as overall mean SEQ:TV scores per school coupled with the weighted mean FCAT Math and Reading scores (Appendix D). Individual schools or other stakeholders may take a closer look at the data to either gain insights to their schools' strengths and/or weaknesses in an effort to mitigate problem areas of climate or accentuate positive climate characteristics. Implementing a plan to improve a school's identified climate deficiencies may be an efficient way to focus resources.

Stakeholders can take note that any policies, procedures, instructional materials, or professional development that improves a school's climate may have a positive impact on elementary FCAT Math scores. It may also be important for stakeholders to take note of the schools with high academic achievement. Noting their SEQ:TV scores on each dimension may give stakeholders a model for replication. These attributes may provide a template for those crafting policies, procedures, and professional development.

Research Question 2

Are the school climate scores from the seven dimensions on the SEQ:TV related to FCAT Math scores at the middle school level?

Findings. This model predicting FCAT middle school math mean scores (criterion variable) from the predictor variables was significant, $F(7, 22) = 7.398$, $p < .05$ with an R^2 of .702 and an Adjusted R^2 of .607. H_0 can be rejected at the middle school level. 70.2% of middle school FCAT Math scores can be predicted by SEQ:TV scores. Of the 30 middle schools included in this study, the statistical analysis determined that the seven climate factors collectively were significant predictors of student achievement as measured by FCAT Math scores at the middle school level.

Two of the seven predictor variables were individually significant. The percentage of these predictor variables' ability to predict FCAT Math at the middle school level were (a) Frequent Monitoring of Student Progress (14%), and (b) Positive School/Home Relations 33%.

Conclusions. The following conclusions are based on the analysis of the data collected in the process of answering Research Question 2:

1. There was a relationship between the mean climate scores and the mean FCAT Math scores at the middle school level.
2. This model indicated the very large effect size of 70.2%. This is the percentage of middle school FCAT Math scores that could be predicted by the SEQ:TV scores.
3. Collectively, all seven climate dimensions were significant and positively related to FCAT scores.
4. Two of the seven climate dimensions (Frequent Monitoring of Student Progress and Positive School/Home Relations) could predict FCAT Math scores at the middle school level.

After expanding the view of these data to include another perspective of this relationship between FCAT scores and school climate, these data revealed a discernable pattern. The schools achieving FCAT Math scores above the mean at the middle school level were more likely to have SEQ:TV scores above the mean. The schools with FCAT Math scores below the mean were more likely to have SEQ:TV scores below the mean.

Table 9 contains data that illustrate the apparent relationship that existed between the predictor variables (SEQ:TV scores) and the FCAT Math scores of schools at the middle school level. All middle schools scoring above or below the mean SEQ-TV score for middle school were identified and selected for additional analysis. This table contains the weighted FCAT Math mean scale scores and the mean SEQ:TV scores of all the middle schools in this study. Its examination underscored any possible association between low SEQ:TV scores, high SEQ:TV scores, low FCAT Math scores and high FCAT Math scores. Deviations from each mean score were highlighted using designated

indicators. These indicators provide the reader with the status of the scores relative to their respective means. For a thorough explanation of the meaning and purpose of these descriptors, see the *Conclusions* section of Research Question 1 previously in this chapter.

There were eleven middle schools that had SEQ:TV scores above or below the mean SEQ:TV score for their respective grade level. To keep the schools anonymous, they were numbered 1 to 11. The following table presents the mean SEQ:TV score with the mean score status indicator and that school’s weighted mean FCAT Math score accompanied by the mean score status indicator:

Table 9

Mean Middle School FCAT Math and SEQ:TV Scores With

Deviation From Mean Indicators

| School Number | Mean SEQ Score | Weighted Math Means |
|---------------|----------------|---------------------|
| 1 | 4.0-A | 357A |
| 2 | 3.6-B | 291B |
| 3 | 3.2-B | 295B |
| 4 | 4.0-A | 357A |
| 5 | 3.6-B | 288B |
| 6 | 3.4-B | 339A |
| 7 | 3.4-B | 280B |
| 8 | 3.7-B | 286B |
| 9 | 3.8A | 290B |
| 10 | 3.6-B | 340A |
| 11 | 4.2-A | 351A |

A= above mean B= below mean, W= Within 1 Standard Deviation

Examining the data contained in Table 9 revealed a discernable pattern. Of the 11 schools scoring outside 1 Standard Deviation (SD), four schools scored above the mean SEQ:TV score and seven scored below the mean SEQ:TV score. Of the four scoring

above the mean SEQ:TV score, three also scored above 1 SD of the mean FCAT Math scale score.

Of the seven middle schools scoring below the mean SEQ:TV score, five also scored below 1 SD on the FCAT Mean Math scale score. There was one school above the mean SEQ:TV score that scored below 1 SD on the FCAT Math test and two that were below the mean SEQ:TV score that scored above 1 SD on the FCAT Math test. Their relationships were negative.

These data offered the reader of this study insights into possible causes for either low or high FCAT scores. Though additional research would be required to fully understand the full meaning of this data, the following conclusions have been reached:

1. A majority percentage of the schools with SEQ:TV scores above the mean also had achievement scores not only above the mean, but fully above 1 SD of the respective mean.
2. A majority percentage of schools scoring below the mean SEQ:TV score also scored fully below 1 SD on the FCAT Math test.
3. At the extremes of the achievement scale, there was a positive relationship between school climate and academic achievement at the middle school level at the schools involved in this study.
4. Frequent Monitoring of Student Progress and Positive School/Home Relations were the two individual dimensions determined to be significant and positively related to FCAT Math at the middle school level.

Mean scores for all seven climate dimensions as well as overall mean SEQ:TV scores per school coupled with the weighted mean FCAT Math and Reading scores were

provided in Appendix D. Individual schools or other stakeholders may take a closer look at the data to either gain insights to their schools' strengths and/or weaknesses in an effort to mitigate problem areas of climate or accentuate positive climate characteristics.

Frequent Monitoring of Student Progress and Positive School/Home Relations were the two individual dimensions determined to be significant and positively related to FCAT Math at the middle school level. Stakeholders may consider the two climate dimensions that were significant and positive (Frequent Monitoring of Student Progress and Positive School/Home Relations) when determining where to focus their attention when working to improve school climate.

Stakeholders can take note that any policies, procedures, instructional materials, or professional development that improves a school's climate may have a positive impact on middle school FCAT Math scores and as such, may be implemented by stakeholders. It may also be important for stakeholders to take note of the schools with high academic achievement. Noting their SEQ:TV scores on each dimension may give stakeholders a model for replication. These attributes may provide a template for those crafting policies, procedures, and professional development.

Research Question 3

Are the school climate scores from the seven dimensions on the SEQ:TV related to FCAT Math scores at the high school level?

Findings. This model predicting FCAT high school math mean scores (criterion variable) from the predictor variables was significant, $F(7, 14) = 11.339$, $p < .05$ with an R^2 of .850 and an Adjusted R^2 of .775. H_03 can be rejected. 85% of high school FCAT Math scores can be predicted by SEQ:TV scores.

Each of the seven predictor variables was individually significant and positively related to FCAT Math at the high school level. The percentage of each predictor variable's ability to predict FCAT Math at the elementary level were (a) Instructional Leadership 21%, (b) Clear and Focused Mission 19%, (c) Positive School Climate 29%, (d) High Expectations 35%, (e) Frequent Monitoring of Student Progress (21%), (f) Time on Task (20%), and (g) Positive School/Home Relations 51%.

Conclusions. The following conclusions are based on the analysis of the data collected in the process of answering Research Question 3:

1. There was a relationship between the mean climate scores and the mean FCAT Math scores at the high school level.
2. This model indicated the very large effect size of 85%. This is the percentage of high school FCAT Math scores that can be predicted by the SEQ:TV scores.
3. All seven climate dimensions collectively were significant and positively related to FCAT scores.
4. The seven predictor variables individually produced significant and positive predictability scores ranging from moderate effect size (in the 20% range) to large effect size (30% to 50%).

These data analyzed from an alternate perspective produced a discernable pattern. The schools achieving FCAT Math scores above the mean at the high school level were more likely to have SEQ:TV scores above the mean. The schools with FCAT Math scores below the mean were more likely to have SEQ:TV scores below the mean.

The following data illustrate the apparent relationship that existed between the predictor variables (SEQ:TV scores) and the FCAT Math scores of schools at the high

school level. To illustrate the point that low SEQ:TV climate scores seem to be associated with low FCAT Math scores and high SEQ:TV scores may be associated with high FCAT Math scores, the schools scoring above or below the mean SEQ:TV score for their respective grade level were identified and examined further. These schools are important to policy makers for two reasons and as such, are an important part of this discussion. Schools scoring below the mean are targeted by school districts for immediate academic attention. Multiple policies are in place to improve the FCAT scores of these schools. Schools at the higher end of academic achievement as defined by FCAT Math scores are rewarded for their achievement.

A table containing the weighted FCAT Math mean scores and the mean SEQ:TV scores of all the high schools scoring above or below 1 Standard Deviation from the mean FCAT Math score for their respective grade level was created to help examine any possible association between low SEQ:TV scores, high SEQ:TV scores, low FCAT Math scores and high FCAT Math scores. Deviations from each mean score were highlighted using designated indicators. These indicators provided the reader of this study with the status of the scores relative to their respective means. For a thorough explanation of the meaning and purpose of these descriptors, see the *Conclusions* section of Research Question 1 previously in this chapter.

There were six high schools that had SEQ:TV scores above or below the mean SEQ:TV score for their respective grade level. To keep the schools anonymous, they were numbered 1 to 6. The following table presents the mean SEQ:TV score with the mean score status indicator and that school's weighted mean FCAT Math score accompanied by the mean score status indicator:

Table 10

Mean High School FCAT Math and SEQ:TV Scores With

Deviation From Mean Indicators

| School Number | Mean SEQ score | FCAT Math Weighted Means |
|---------------|----------------|--------------------------|
| 1 | 4.1-A | 354-A |
| 2 | 3.4-B | 284-B |
| 3 | 3.3-B | 287-B |
| 4 | 4.0-A | 301-W |
| 5 | 3.4-B | 289-B |
| 6 | 3.9-A | 364-A |

A= above mean B= below mean, W= Within 1 Standard Deviation

The examination of the data contained in Table 10, reveals a discernable pattern. Of the six schools scoring outside 1 Standard Deviation (SD), three schools scored above the mean SEQ:TV score and three scored below the mean SEQ:TV score. Of the three scoring above the mean SEQ:TV score, two also scored above 1 SD of the mean FCAT Math scale score.

Of the three high schools scoring below the mean SEQ:TV score, 3 also scored below 1 SD on the FCAT Mean Math scale score. There was one school above the mean SEQ:TV score that scored within 1 SD on the FCAT Math test.

Though further research would be required to fully understand the full extent of the meaning of these data, the following conclusions are made:

1. An majority percentage of the schools with SEQ:TV scores above the mean also had achievement scores not only above the mean, but fully above 1 SD of the respective mean.

2. Conversely, all of the schools scoring below the mean SEQ:TV score also scored below 1 SD on the FCAT Math test.

3. At the extremes of the achievement scale, there was a positive relationship between school climate and academic achievement at the high school level at the schools involved in this study.

This study provided mean scores for all seven climate dimensions as well as overall mean SEQ:TV scores per school coupled with the weighted mean FCAT Math and Reading scores (Appendix D). Individual schools or other stakeholders may take a closer look at the data to either gain insights to their schools' strengths and/or weaknesses in an effort to mitigate problem areas of climate or accentuate positive climate characteristics. It may benefit stakeholders to consider the fact that all seven climate dimensions were determined to be significant and positively related to FCAT Math scores at the high school level. This knowledge may help stakeholders prioritize their use of resources to improve school climate.

Stakeholders can take note that any policies, procedures, instructional materials, or professional development that improves a school's climate may have a positive impact on high school FCAT Math scores. It may also be important for stakeholders to take note of the schools with high academic achievement. Noting their SEQ:TV scores on each dimension may give stakeholders a model for replication. These attributes may provide a template for those crafting policies, procedures, and professional development.

Research Question 4

Are the school climate scores from the seven dimensions on the SEQ:TV related to FCAT Reading scores at the elementary school level?

Findings. All SEQ scores were significantly and positively related to elementary FCAT Reading mean scale scores. This model predicting FCAT elementary school Reading mean scores (criterion variable) from the predictor variables was significant, $F(7, 92) = 28.43, p < .05$ with an R^2 of .684 and an Adjusted R^2 of .660. H_04 can be rejected. 68% of elementary FCAT Reading scores can be predicted by school climate scores. Of the 100 elementary schools included in this study, the statistical analysis determined that all seven climate factors collectively were significant predictors of student achievement as measured by FCAT Reading scores at the elementary school level.

Each of the seven predictor variables was individually significant and positive. The percentage of each predictor variable's ability to predict FCAT Reading at the elementary level were (a) Instructional Leadership 9%, (b) Clear and Focused Mission 19%, (c) Positive School Climate 21%, (d) High Expectations 16%, (e) Frequent Monitoring of Student Progress 20%, (f) Time on Task (23%), and (g) Positive School/Home Relations 45%.

Conclusions. The following conclusions are based on the analysis of the data collected in the process of answering Research Question 4:

1. There was a relationship between the mean climate scores and the mean FCAT Reading scores at the elementary level.
2. All seven climate dimensions collectively were significant and positively related to FCAT scores.
3. This model indicated the very large effect size of 68%. This is the percentage of elementary FCAT Reading scores that can be predicted by the SEQ:TV scores.

4. All seven climate dimensions individually are significant and positively related to FCAT scores.

The examination of these data illuminated a discernible pattern. The schools achieving FCAT Reading scores above the mean at the elementary school level were more likely to have SEQ:TV scores above the mean. The schools with FCAT Reading scores below the mean were more likely to have SEQ:TV scores below the mean.

The following data illustrated the apparent relationship that existed between the predictor variables (SEQ:TV scores) and the FCAT Reading scores of schools at the elementary school level. To illustrate the point that low SEQ:TV climate scores seem to be associated with low FCAT Reading scores and high SEQ:TV scores may be associated with high FCAT Reading scores, the schools scoring above or below the mean SEQ:TV score for their respective grade level were identified and examined further.

A table containing the weighted FCAT Reading mean scores and the mean SEQ:TV scores of all the elementary schools scoring above or below 1 Standard Deviation from the mean on the FCAT Reading for their respective grade level was created to help examine any possible association between low SEQ:TV, high SEQ:TV scores, low FCAT Reading scores and high FCAT Reading scores. Deviations from each mean score are highlighted using designated indicators. These indicators provided the status of the scores relative to their respective means. For a thorough explanation of the meaning and purpose of these descriptors, see the *Conclusions* section of Research Question 1 previously in this chapter.

There were 43 elementary schools that had SEQ:TV scores above or below the mean SEQ:TV score for their respective grade level. To keep the schools anonymous,

they were numbered 1 to 43. Table 11 presents the mean SEQ:TV score with the mean score status indicator and that school's weighted mean FCAT Reading score accompanied by the mean score status indicator:

Table 11

Mean Elementary School FCAT Reading and SEQ:TV Scores With Deviation From Mean Indicators

| School Number | Mean SEQ Score | Weighted Reading Means |
|---------------|----------------|------------------------|
| 1 | 4-B | 351A |
| 2 | 3.8-B | 285B |
| 3 | 4.7-A | 358A |
| 4 | 3.9-B | 277B |
| 5 | 4.4-A | 356A |
| 6 | 4.5-A | 333A |
| 7 | 4.2-A | 336A |
| 8 | 3.7-B | 295W |
| 9 | 4.5-A | 357A |
| 10 | 3.7-B | 269B |
| 11 | 4.3-A | 284B |
| 12 | 3.4-B | 269B |
| 13 | 4.3-A | 336A |
| 14 | 3.9-B | 278B |
| 15 | 3.7-B | 285B |
| 16 | 4.6-A | 339A |
| 17 | 3.8-B | 280B |
| 18 | 4.6-A | 347A |
| 19 | 4.4-A | 345A |
| 20 | 4.1-B | 281B |
| 21 | 4.3-A | 339A |

(table continues)

Table 11 (*continued*)

| School Number | Mean SEQ Score | Weighted Reading Means |
|---------------|----------------|------------------------|
| 22 | 3.5-B | 264B |
| 23 | 4.2-A | 339A |
| 24 | 4.2-A | 341A |
| 25 | 4.8-A | 283B |
| 26 | 3.2-B | 285B |
| 27 | 4.3-A | 270B |
| 28 | 4.2-A | 285B |
| 29 | 4.1-B | 342A |
| 30 | 3.9-B | 279B |
| 31 | 4.5-A | 286W |
| 32 | 4.4-A | 283B |
| 33 | 4.1-B | 278B |
| 34 | 4.1-B | 282B |
| 35 | 4.3-A | 288W |
| 36 | 4.4-A | 336A |
| 37 | 4.3-A | 339A |
| 38 | 4.3-A | 336A |
| 39 | 4-B | 280B |
| 40 | 4.2-A | 357A |
| 41 | 4.2-A | 282B |
| 42 | 3.2-B | 270B |
| 43 | 4.1-B | 279B |

A= above mean B= below mean, W= Within 1 Standard Deviation

A discernible pattern emerged when examining the data contained in Table 11. Of the 43 schools scoring outside 1 Standard Deviation (SD), 24 schools scored above the mean SEQ:TV score and 19 scored below the mean SEQ:TV score. Of the 24 scoring above the mean SEQ:TV score, 16 also scored above 1 SD of the mean FCAT Reading scale score.

Of the 19 elementary schools scoring below the mean SEQ:TV score, 16 also scored below 1 SD on the FCAT Mean Reading scale score. There were five schools above the mean SEQ:TV scores that scored below 1 SD on the FCAT Reading test and

one that was below the mean SEQ:TV score that scored above 1 SD on the FCAT Reading test. Their relationships were negative. There were two schools with SEQ:TV scores above the mean that were within 1 SD and one school scoring below the mean on the SEQ:TV survey and within 1 SD of the mean FCAT scale score.

Though further research would be required to fully understand the full extent of the meaning of these data, the following conclusions can be made:

1. A majority percentage of the schools with SEQ:TV scores above the mean also had achievement scores not only above the mean, but fully above 1 SD of the respective mean.
2. Conversely, a majority percentage of schools scoring below the mean SEQ:TV score also scored fully below 1 SD on the FCAT Reading test.
3. At the extremes of the achievement scale, there was a positive relationship between school climate and academic achievement at the elementary level at the schools involved in this study.

This information may aid stakeholders when allocating funds and setting policy. Materials or strategies available to stakeholders that improve a school's climate may have a positive impact on elementary FCAT Reading scores. Taking note of the schools with high academic achievement may prove to be important to educational leaders. Noting their SEQ:TV scores on each dimension may give stakeholders a model for replication.

Research Question 5

Are the school climate scores from the seven dimensions on the SEQ:TV related to FCAT Reading scores at the middle school level?

Findings. This model predicting FCAT middle school reading mean scores (criterion variable) from the predictor variables was significant, $F(7, 22) = 9.058$, $p < .05$ with an R^2 of .742 and an Adjusted R^2 of .660. H_05 can be rejected. 74.2% of middle school FCAT Reading scores can be predicted by SEQ:TV scores. Of the 30 middle schools included in this study, the statistical analysis determined that the seven climate factors collectively were significant predictors of student achievement as measured by FCAT Reading scores at the middle school level.

Two of the seven predictor variables were individually significant. The percentage of these predictor variables' ability to predict FCAT Reading at the middle school level were (a) Frequent Monitoring of Student Progress (14%), and (b) Positive School/Home Relations 37%.

Conclusions. The following conclusions are based on the analysis of the data collected in the process of answering Research Question 5:

1. There is a relationship between the mean climate scores and the mean FCAT Reading scores at the middle school level.
2. This model indicates the very large effect size of 74.2%. This is the percentage of middle school FCAT Reading scores that can be predicted by the SEQ:TV scores.
3. Collectively, all seven climate dimensions are significant and positively related to FCAT scores.
4. Two of the seven climate dimensions (Frequent Monitoring of Student Progress and Positive School/Home Relations) can predict FCAT Reading scores at this level.

As these data were examined, a discernable pattern emerged. The schools achieving FCAT Reading scores above the mean at the middle school level were more likely to have SEQ:TV scores above the mean. The schools with FCAT Reading scores below the mean were more likely to have SEQ:TV scores below the mean.

The following data illustrate the apparent relationship that existed between the predictor variables (SEQ:TV scores) and the FCAT Reading scores of schools at the middle school level. To illustrate the point that low SEQ:TV climate scores seem to be associated with low FCAT Reading scores and high SEQ:TV scores may be associated with high FCAT Reading scores, the schools scoring above or below the mean SEQ:TV score for their respective grade level were identified and examined further.

A table containing the weighted FCAT Reading mean scores and the mean SEQ:TV scores of all the middle schools scoring above or below 1 Standard Deviation from the mean on the FCAT Reading for their respective grade level was created to help examine any possible association between low SEQ:TV, high SEQ:TV scores, low FCAT Reading scores and high FCAT Reading scores. Deviations from each mean score were highlighted using designated indicators. These indicators provided the reader of this study with the status of the scores relative to their respective means. For a thorough explanation of the meaning and purpose of these descriptors, see the *Conclusions* section of Research Question 1 previously in this chapter.

There were 11 middle schools that had SEQ:TV scores above or below the mean SEQ:TV score for their respective grade level. To keep the schools anonymous, they were numbered 1 to 11. Table 12 presents the mean SEQ:TV score with the mean score

status indicator and that school's weighted mean FCAT Reading score accompanied by the mean score status indicator:

Table 12

Mean Middle School FCAT Reading and SEQ:TV Scores With Deviation From Mean Indicators

| School Number | Mean SEQ Score | Weighted Reading Means |
|---------------|----------------|------------------------|
| 1 | 4.0-A | 356A |
| 2 | 3.6-B | 283B |
| 3 | 3.2-B | 289W |
| 4 | 4.0-A | 345A |
| 5 | 3.6-B | 285B |
| 6 | 3.4-B | 330W |
| 7 | 3.4-B | 270B |
| 8 | 3.7-B | 272B |
| 9 | 3.8A | 272B |
| 10 | 3.6-B | 330W |
| 11 | 4.2-A | 341A |

A= above mean B= below mean, W= Within 1 Standard Deviation

When examining the data contained in Table 12, a discernable pattern emerged. Of the 11 schools scoring outside 1 Standard Deviation (SD), 4 schools scored above the mean SEQ:TV score and 7 scored below the mean SEQ:TV score. Of the four scoring above the mean SEQ:TV score, three also scored above 1 SD of the mean FCAT Reading scale score.

Of the seven middle schools scoring below the mean SEQ:TV score, four also scored below 1 SD on the FCAT Mean Reading scale score. There was one school above the mean SEQ:TV score that scored below 1 SD on the FCAT Reading test. That relationship was negative. There were three schools scoring below the mean on the SEQ:TV survey that scored within 1 Standard deviation on the FCAT Reading test.

Though additional research would be required to fully understand the extent of the meaning of these data, the following conclusions can be made:

1. An appreciable percentage of the schools with SEQ:TV scores above the mean also had achievement scores not only above the mean, but fully above 1 SD of the respective mean.
2. A substantial percentage of schools scoring below the mean SEQ:TV score also scored fully below 1 SD on the FCAT Reading test.
3. At the extremes of the achievement scale, there was a positive relationship between school climate and academic achievement at the middle school level at the schools involved in this study.

This information may aid stakeholders when allocating funds and setting policy. Stakeholders can take note that any policies, procedures, instructional materials, or professional development that improves a school's climate may have a positive impact on middle school FCAT Reading scores. It may also be important for stakeholders to take note of the schools with high academic achievement. Noting their SEQ:TV scores on each dimension may give stakeholders a model for replication.

Research Question 6

Are the school climate scores from the seven dimensions on the SEQ:TV related to FCAT Reading scores at the high school level?

Findings. This model predicting FCAT high school reading mean scores (criterion variable) from the predictor variables was significant, $F(7, 14) = 13.729$, $p < .05$ with an R^2 of .873 and an Adjusted R^2 of .809. H_06 can be rejected. 87.3% of high school FCAT

Reading scores can be predicted by SEQ:TV scores. Each of the seven predictor variables was collectively significant.

There were five predictor variables that were individually significant and positive. The percentage of each predictor variable's ability to predict FCAT Reading at the high school level were (a) Positive School Climate (26%), (b) High Expectations (31%), (c) Frequent Monitoring of Student Progress (18%), (d) Time on Task (18%), and (e) Positive School/Home Relations (48%).

Conclusions. The following conclusions are based on the analysis of the data collected in the process of answering Research Question 6:

1. There was a relationship between the mean climate scores and the mean FCAT Reading scores at the high school level.
2. This model indicates the very large effect size of 87.3%. This is the percentage of high school FCAT Reading scores that can be predicted by the SEQ:TV scores.
3. All seven climate dimensions collectively were significant and positively related to FCAT scores.
4. Five predictor variables (Positive School Climate, High Expectations, Frequent Monitoring of Student Progress, Time on Task, and Positive School/Home Relations) individually produced significant and positive predictability scores ranging from moderate effect size (in the 18% range) to large effect size (31% to 48%).

In the process of examining these data, a pattern was observed. The schools achieving FCAT Reading scores above the mean at the high school level were more

likely to have SEQ:TV scores above the mean. The schools with FCAT Reading scores below the mean were more likely to have SEQ:TV scores below the mean.

The following data illustrate the apparent relationship that existed between the predictor variables (SEQ:TV scores) and the FCAT Reading scores of schools at the high school level. To illustrate the point that low SEQ:TV climate scores seem to be associated with low FCAT Reading scores and high SEQ:TV scores may be associated with high FCAT Reading scores, the schools scoring above or below the mean SEQ:TV score for their respective grade level were identified and examined further.

A table containing the weighted FCAT Reading mean scores and the mean SEQ:TV scores of all the high schools scoring above or below 1 Standard Deviation from the mean FCAT Reading scale scores was created to help examine any possible association between low SEQ:TV scores, high SEQ:TV scores, low FCAT Reading scores and high FCAT Reading scores. Deviations from each mean score were highlighted using designated indicators. These indicators provided the reader of this study with the status of the scores relative to their respective means. For a thorough explanation of the meaning and purpose of these descriptors, see the *Conclusions* section of Research Question 1 previously in this chapter.

There were six high schools that had SEQ:TV scores above or below the mean SEQ:TV score for their respective grade level. To keep the schools anonymous, they were numbered 1 to 6. The following table presents the mean SEQ-TV score with the mean score status indicator and that school's weighted mean FCAT Reading score accompanied by the mean score status indicator:

Table 13

Mean High School FCAT Reading and SEQ:TV Scores With

Deviation From Mean Indicators

| School Number | Mean SEQ score | FCAT Reading Weighted Means |
|---------------|----------------|-----------------------------|
| 1 | 4.1-A | 364-A |
| 2 | 3.4-B | 268-B |
| 3 | 3.3-B | 267-B |
| 4 | 4.0-A | 282-B |
| 5 | 3.4-B | 275-B |
| 6 | 3.9-A | 363-A |

A= above mean B= below mean, W= Within 1 Standard Deviation

When examining the data contained in Table 13, a discernible pattern emerged. Of the six schools scoring outside 1 Standard Deviation (SD), three schools scored above the mean SEQ:TV score and three scored below the mean SEQ:TV score. Of the three scoring above the mean SEQ:TV score, two also scored above 1 SD of the mean FCAT Reading scale score.

Of the three high schools scoring below the mean SEQ:TV score, three also scored below 1 SD on the FCAT Mean Reading scale score. There was one school above the mean SEQ:TV score that scored below 1 SD on the FCAT Reading test.

Though further research would be required to fully understand the full extent of the meaning of this data, the following conclusions can be made:

1. An appreciable percentage of the schools with SEQ:TV scores above the mean also have achievement scores not only above the mean, but fully above 1 SD of the respective mean.

2. Conversely, all of the schools scoring below the mean SEQ:TV score also scored below 1 SD on the FCAT Reading test.

3. The data produced by this study reveals that at the extremes of the achievement scale, there was a positive relationship between school climate and academic achievement at the high school level.

This information may aid stakeholders when allocating funds and setting policy. As this study has provided evidence that climate indeed affected student achievement as measured by FCAT scores, this expanded look at the highest and lowest achieving schools provided additional context regarding what happens at school sites relative to achievement. An analysis of these data produced by this study lead to the conclusion that elementary, middle, and high schools with mean FCAT Reading and/or Math scores below 1 Standard Deviation predominantly had SEQ:TV scores below the mean for the respective school level. Elementary, middle, and high schools with mean FCAT Reading and/or Math scores above 1 Standard Deviation predominantly had SEQ:TV scores above the mean for the respective school level. Stakeholders equipped with this information can target efforts to improve the climate of schools at the low end of the achievement scale. Efforts to improve the climate of schools with SEQ:TV scores below the mean may be considered by stakeholders as a part of any plan to improve student academic achievement.

Discussion of Correlations

The following discussion refers to the correlations matrices generated by the SPSS Multiple Regression analyses located in Tables 5 through 7. The discussion examines the relationships between the seven climate dimensions on the SEQ:TV survey

(predictor variables) and the FCAT Math and Reading scores (criterion variables) at all three school levels.

FCAT Math and FCAT Reading Scores and Positive School Climate

The linear associations between the two criterion variables of FCAT Math and Reading scores and the predictor variable Positive School Climate were positive based on the values determined by the SPSS analysis. The correlation value for FCAT Math scores and this predictor variable at the elementary school level was fairly strong at .501. The value for middle school level was not as strong but still indicated a positive association at .330. High school values were strongest indicating a fairly significant association at .537. FCAT Reading scores and Positive School Climate also had a positive association. Elementary and high school levels had moderately strong linear association values of .455 and .508 respectively. The middle school values were less strong with a value of .335.

These positive associations confirm the findings in many of the studies cited in the Literature Review provided in Chapter 2 of this study. Teachers' perceptions of their school's climate can predict the achievement of their students. The predictor variables in this study were based on teacher and staff perceptions. The literature cited concludes that if teachers perceive their school to be unfair in the treatment of issues, chaotic, unsafe, not supportive, unclean, etc., they are less motivated, distracted and generally unhappy with their circumstances (Banks, 2004; Beran & Shapiro, 2005; Ferguson & Mehta, 2004; Gay, 2002; Grant et al., 1999; Hoy et al., 2006; Kozol, 2000; Ladson-Billings, 2006). These researchers conclude these perceptions affect teacher and student

achievement in a negative way. These data produced by this study support the previous studies that various school climate dimensions affect student achievement.

FCAT Math and FCAT Reading Scores and High Expectations

There were positive associations between these two criterion variables and this predictor variable. The middle school FCAT Math score level indicated a marginal value at .278. The associations between these variables were stronger between elementary schools and high schools. The values were .463 and .592 respectively. The FCAT Reading scores and High Expectations indicated a positive association. High school level showed the strongest association with a value of .561 followed by elementary with a value of .402 and then followed by middle school with a value of .278.

The studies cited in the Chapter 2 conclude that these high expectations can take the form of the construct “academic optimism” (Hoy et al., 2006). Their research and others’ conclude that a school with high expectations from all stakeholders fosters a climate that translates directly into higher achievement (Gruenert, 2006; Hoy & Miskel, 2005). This was an indicator that climate factors can predict student achievement and this study contributes to the knowledge base regarding the subject of school climate. The findings of this study support and are supported by previous research.

FCAT Math and FCAT Reading Scores and Frequent Monitoring of Student Progress

These variables showed a moderate linear association. FCAT Math scores were positively correlated with this predictor variable. Elementary schools were slightly higher than high school with values of .501 and .459 respectively. Middle schools yielded a correlation value of .377. The FCAT Reading scores and this predictor variable also showed a positive association. All three school levels had moderate linear associations

with elementary having the highest value of .442 followed by high school at .422 followed by middle school with a value of .380.

This predictor variable is an indicator of the perceptions of teachers and staff members that their schools prioritize accountability and an emphasis on organizational structure. According to previous research, when teachers are confident in the abilities, goals and structure of their environment, they have a higher sense of confidence known as “collective efficacy” (Hoy et al., 2006).

FCAT Math and FCAT Reading Scores and Time on Task

FCAT Math scores and the predictor variable Time on Task had a linear association at all three school levels. The values of .538 for elementary, .346 for middle and .453 for high school all indicate an association that confirmed this predictor variable can indeed be used to predict FCAT Math scores. Regression analysis indicated a positive association between FCAT Reading scores and this predictor variable. These variables showed a moderate linear association with scores of .484, .352 and .427 for elementary, middle and high schools, respectively.

These data are supported by studies that conclude that schools that emphasize orderly behavior and model that behavior in their management of time perform at higher academic levels (Barber et al., 2006).

FCAT Math and FCAT Reading Scores and Positive Home-School Relations

The Math scores and this predictor variable had a very strong linear association with values of .685, .571 and .712 for elementary, middle and high school respectively. The FCAT Reading scores and this predictor variable association values were also strong, indicating substantial linear associations between these variables. High school scores

were highest with a score of .691. Elementary and middle followed with scores of .669 and .606 respectively.

This is another indicator that climate factors can predict student achievement. Several studies cited in Chapter 2 confirm that the relationship between teachers, staff, and administrators plays a vital role in the climate of the school and in turn the academic achievement of the students (Fullan & Hargreaves; 1996; Gruenert, 2006).

FCAT Math and FCAT Reading Scores and Instructional Leadership

This predictor variable and all three levels of FCAT Math scores were positively associated; however, two of the three school levels produced values showing a moderate linear association. They were elementary and high schools with scores of .340 and .429 respectively. The value of .079 for middle schools shows a low level of association and predictability of academic achievement. The linear association produced by this multiple regression model for FCAT Reading was similar to that produced by the FCAT Math and Instructional Leadership variables. For the FCAT Reading scores and this predictor variable, elementary and high school levels were moderate at .303 and .386 respectively while middle school was very weak with a value of .073. This weak association related to FCAT scores and Instructional Leadership at the middle school level may need further research to assess the cause.

Instructional leadership is influenced by gender, desire or willingness to delegate authority, time removed from the classroom, management philosophy, academic philosophy and other factors (Blackburn et al., 2006; Blase & Blase, 1999; Castle & Mitchell, 2005). Academic leaders are said to set the tone for every facet of the school (Chu & Fu, 2006; Daugherty et al., 2005).

FCAT Math and FCAT Reading Scores and Clear and Focused Mission

The multiple regressions yielded a positive association between FCAT Math and Reading scores and this predictor variable at all school levels. For FCAT Math scores, elementary and high schools had values that show a moderate linear association with values of .496 and .431 respectively. Middle schools produced a relatively low value of .148. The analysis revealed linear association values for FCAT Reading and this predictor variable for elementary and high schools that were moderate at values of .440 and .402 respectively. A relatively low association was noted for middle school with a value of .181. This climate dimension can be associated with Instructional Leadership in that a characteristic of high-quality management is a well planned set of goals and a plan for assessing the progress toward those goals (Moorhead & Griffin, 2004).

These data confirm the previous research cited in Chapter 2 that these traits have an effect on school climate. It also confirms the findings in Chapter 4 that FCAT Math and FCAT Reading scores can be predicted by knowing the climate scores of individual schools. This positive linear association was determined to be present at the elementary, middle and high school levels. While still being positively associated with the criterion variables, the weakest predictor was Instructional Leadership and that was only at the middle school level. The data obtained by this study can confirm that all six null hypotheses can be rejected.

Conclusions of Correlation Data

Many of the studies cited in Chapters 1 and 2 of this study concluded that climate was and is a factor in academic achievement. These studies devoted time and energy to understanding how school climate was affected and the results of those effects. Others

published works that studied how race and culture affected socioeconomics, which in turn affected academic achievement (Banks, 2004; Gay, 2002; Kozol, 2000; Ladson-Billings, 2006). As this study has provided data that confirms there is a positive relationship between school climate and academic achievement as measured by FCAT scores, it may also provide additional context as we assess what happens at school sites related to climate and achievement. This information could give stakeholders insight in to causes of academic success or failure, lead us to meaningful reforms and spawn further studies. An examination of the data produced by this study can lead us to conclude that climate is formed by a variety of measurable dimensions all sharing an effect on achievement. These factors appear to influence the relationship between school climate and student academic achievement.

Summary and Conclusions

This study confirms the work of previous researchers that many factors including school climate may be affecting the academic achievement of America's students (Cambourne, 1995; Caroline et al., 2003; Goddard et al., 2000; American Federation of Teachers, 2007). In an effort to better understand this issue, this study tested for possible relationships between the school climate of multiple schools and their students' academic achievement. Observations and experiences documented by this study, as well as in other districts and in diverse educational settings, illuminate factors other than academic abilities that affect academic achievement.

The data produced by this study indicated that all seven SEQ:TV survey climate dimensions, collectively, are significant and positively related to elementary Math, high school Math, and elementary Reading FCAT scale scores. Frequent Monitoring of

Student Progress and Positive Home/School Relations are significant and positively related to mean FCAT Math and FCAT Reading scale scores at the middle school level. Positive School Climate, Frequent Monitoring of Student Progress, Time on Task, and Positive Home/School Relations SEQ:TV scores are significantly and positively related to high school FCAT Reading mean scale scores.

From the results of this data collection it can be concluded that one SEQ:TV climate dimension was clearly the strongest indicator of FCAT scores. That dimension was Positive Home/School Relations. It had a large effect size for FCAT Math and Reading at all 3 school levels. For Math at the elementary, middle and high school levels, the effect sizes were 47%, 33%, and 51% respectively. For FCAT Reading at the elementary, middle, and high school level, the effect sizes were 45%, 37%, and 48% respectively. These are the percentages of FCAT scores that can be predicted by SEQ:TV scores. Stakeholders may find this information quite valuable when crafting (a) policies, (b) procedures, and (c) allocating funds.

The statements related to Positive Home/School Relations on the SEQ:TV include (a) Parents actively participate in establishing school policies and procedures; (b) Parents actively participate in school activities; (c) Effective and frequent communication occurs with parents; (d) Community resources are used to support the school's program; (e) Social services from available outside agencies are effectively utilized; and (f) Parents are encouraged to support the instructional activities of the school. The responses to these statements were determined to have the largest effect size. Stakeholders may choose to consider this data when working to improve school climate. Focusing on the

specific SEQ:TV dimensions that are significant and have a positive relationship with FCAT scores may provide the most effective use of resources.

The data produced by this study indicate and can lead to the conclusion that mean FCAT scale scores can be predicted by SEQ:TV scores at a high percentage rate. This high percentage of predictability applies to FCAT Reading and Math at elementary, middle, and high school levels. These data provide the ability to reject the null hypotheses related to all six questions and answer all of this study's research questions in the affirmative. The effect size related to each question is large. 69.1% of elementary Math scores, 70.2% of middle school Math scores, and 85% of high school Math scores can be predicted by SEQ:TV scores. 68% of elementary Reading scores, 74.2% of middle school Reading scores, and 87.3% of high school Reading scores can be predicted by SEQ:TV scores. These substantial predictability percentages may instill confidence in stakeholders that efforts to improve school climate will positively affect FCAT scores.

The researcher expanded the study's analyses of the relationships between school climate and academic achievement by isolating schools above or below 1 Standard Deviation from the mean on the FCAT Reading and Math for their respective grade level. This was done to determine if any discernable patterns existed relating to their climate scores and academic achievement. Indeed, high percentages of schools at all school levels had a positive relationship between low climate scores and low achievement scores. The same positive association existed between high climate scores and high achievement scores at schools of all levels. Based on these data, it can be concluded that schools with low SEQ-TV scores are likely to have low FCAT scores as well. It can also be concluded

that this association may be true for FCAT Math and Reading at the elementary, middle and high school levels.

Recommendations

Based on the conclusions that have been drawn from the analysis of data, the following recommendations are made:

1. Provide data to stakeholders related to the positive and significant relationship between school climate and academic achievement.
2. Provide stakeholders with the data supporting the fact that Positive Home/School Relations was the strongest predictor of FCAT Math and Reading scores.
3. Design staff development for the purpose of improving general school climate.
4. Design staff development for the purpose of improving the seven climate dimensions as defined by the SEQ:TV survey.
5. For schools participating in the SEQ:TV survey, identify those schools that have low SEQ:TV scores on the dimensions that have been determined to be significant and positively related to student achievement.
6. Design strategies and instructional materials to improve the specific climate dimensions at the schools needing improvement.
7. Provide facilitators to schools to either implement pre-designed climate improvement strategies or help facilitate the design of their own programs.
8. Encourage policy makers to value school climate development and to prioritize it in their decision making process.

Recommendations for Future Research

This study answered the research questions in the affirmative. As the data was analyzed, some other questions came to the forefront. Educators may benefit from greater research into factors relating to school demographics. Additionally, this study focused on the perceptions of staff members regarding school climate. Some research questions may include:

1. What are the characteristics (demographics) of the schools with mean standardized test scores below 1 Standard Deviation from the mean?
2. What are the characteristics (demographics) of the schools with mean standardized test scores above 1 Standard Deviation from the mean?
3. How does the percentage of out of school suspensions at a school moderate the relationship between academic achievement and school climate?
4. How does the percentage of gifted students at a school moderate the relationship between academic achievement and school climate?
5. How does the percentage of minority students at a school moderate the relationship between academic achievement and school climate?
6. How does the percentage of students accessing free and reduced lunches at a school moderate the relationship between academic achievement and school climate?
7. How does the percentage of out of school suspensions at a school moderate the relationship between academic achievement and school climate?
8. How does the percentage of gifted students at a school moderate the relationship between academic achievement and school climate?

9. How does the percentage of minority students at a school moderate the relationship between academic achievement and school climate?

10. How does the percentage of students accessing free and reduced lunches at a school moderate the relationship between academic achievement and school climate?

11. Is there a relationship between the students' perceptions of school climate and academic achievement?

APPENDIX A

Mean SEQ Scores and Weighted Mean FCAT Reading and Math Scores With Rank
Indicators of Schools Outside 1 Standard Deviation of Mean FCAT Scores and School
Demographic Data

*Elementary School SEQ Scores, FCAT Math and Reading Scores and Demographic Data
With Deviation From Mean Indicators*

| School Number | Mean SEQ Score | Weighted Reading Means | Weighted Math Means | % of Minority Students | % of Free and Reduced Lunch | % Out of School Suspension | % Of Gifted Students |
|---------------|----------------|------------------------|---------------------|------------------------|-----------------------------|----------------------------|----------------------|
| 1 | 4-B | 351A | 367A | 19.0 | 6.0 | 0.0 | 36.0 |
| 2 | 3.8-B | 285B | 309W | 95.0 | 89.0 | 7.0 | 1.0 |
| 3 | 4.7-A | 358A | 373A | 19.0 | 9.0 | 1.0 | 30.0 |
| 4 | 3.9-B | 277B | 295B | 98.0 | 98.0 | 4.0 | 2.0 |
| 5 | 4.4-A | 356A | 372A | 30.0 | 7.0 | 0.0 | 46.0 |
| 6 | 4.5-A | 333A | 351A | 53.0 | 28.0 | 1.0 | 23.0 |
| 7 | 4.2-A | 336A | 353A | 26.0 | 15.0 | 0.0 | 5.0 |
| 8 | 3.7-B | 295W | 302B | 90.0 | 74.0 | 3.0 | 0.0 |
| 9 | 4.5-A | 357A | 381A | 25.0 | 9.0 | 1.0 | 59.0 |
| 10 | 3.7-B | 269B | 293B | 100.0 | 91.0 | 5.0 | 0.0 |
| 11 | 4.3-A | 284B | 316W | 91.0 | 81.0 | 7.0 | 3.0 |
| 12 | 3.4-B | 269B | 297B | 97.0 | 91.0 | 14.0 | 0.0 |
| 13 | 4.3-A | 336A | 359A | 39.0 | 28.0 | 1.0 | 3.0 |
| 14 | 3.9-B | 278B | 295B | 98.0 | 81.0 | 12.0 | 0.0 |
| 15 | 3.7-B | 285B | 297B | 91.0 | 80.0 | 12.0 | 0.0 |
| 16 | 4.6-A | 339A | 349A | 44.0 | 28.0 | 1.0 | 31.0 |
| 17 | 3.8-B | 280B | 304B | 94.0 | 95.0 | 10.0 | 1.0 |
| 18 | 4.6-A | 347A | 362A | 30.0 | 23.0 | 1.0 | 2.0 |
| 19 | 4.4-A | 345A | 360A | 14.0 | 9.0 | 0.0 | 0.0 |
| 20 | 4.1-B | 281B | 313W | 96.0 | 90.0 | 3.0 | 10.0 |
| 21 | 4.3-A | 339A | 354A | 21.0 | 18.0 | 1.0 | 1.0 |
| 22 | 3.5-B | 264B | 271B | 98.0 | 85.0 | 27.0 | 0.0 |
| 23 | 4.2-A | 339A | 355A | 34.0 | 14.0 | 0.0 | 6.0 |
| 24 | 4.2-A | 341A | 351A | 46.0 | 18.0 | 1.0 | 5.0 |
| 25 | 4.8-A | 283B | 320W | 99.0 | 89.0 | 12.0 | 0.0 |
| 26 | 3.2-B | 285B | 308W | 78.0 | 71.0 | 4.0 | 0.0 |
| 27 | 4.3-A | 270B | 297B | 98.0 | 92.0 | 11.0 | 4.0 |
| 28 | 4.2-A | 285B | 306W | 84.0 | 78.0 | 6.0 | 0.0 |
| 29 | 4.1-B | 342A | 360A | 28.0 | 7.0 | 0.0 | 4.0 |
| 30 | 3.9-B | 279B | 319W | 100.0 | 97.0 | 10.0 | 1.0 |
| 31 | 4.5-A | 286W | 304B | 90.0 | 80.0 | 13.0 | 1.0 |
| 32 | 4.4-A | 283B | 300B | 95.0 | 85.0 | 4.0 | 4.0 |
| 33 | 4.1-B | 278B | 293B | 99.0 | 91.0 | 9.0 | 7.0 |
| 34 | 4.1-B | 282B | 306W | 95.0 | 96.0 | 1.0 | 0.0 |
| 35 | 4.3-A | 288W | 298B | 79.0 | 75.0 | 5.0 | 0.0 |

(continued)

| | | | | | | | |
|----|-------|------|------|-------|------|------|------|
| 36 | 4.4-A | 336A | 360A | 25.0 | 13.0 | 0.0 | 3.0 |
| 37 | 4.3-A | 339A | 353A | 34.0 | 24.0 | 2.0 | 14.0 |
| 38 | 4.3-A | 336A | 358A | 42.0 | 21.0 | 1.0 | 5.0 |
| 39 | 4-B | 280B | 299B | 99.0 | 94.0 | 14.0 | 2.0 |
| 40 | 4.2-A | 357A | 378A | 22.0 | 7.0 | 0.0 | 44.0 |
| 41 | 4.2-A | 282B | 301B | 89.0 | 89.0 | 2.0 | 0.0 |
| 42 | 3.2-B | 270B | 290B | 100.0 | 95.0 | 12.0 | 1.0 |
| 43 | 4.1-B | 279B | 302B | 99.0 | 79.0 | 9.0 | 6.0 |

A= above 1 Standard Deviation, B= below 1 Standard Deviation, W= Within 1 Standard Deviation

Middle School SEQ Scores, FCAT Math and Reading Scores and Demographic Data

With Deviation From Mean Indicators

| School Number | Mean SEQ score | FCAT Reading Weighted Means | FCAT Math Weighted Means | % of Minority Students | % of Free and Reduced Lunch | % Out of School Suspension | % of Gifted Students |
|---------------|----------------|-----------------------------|--------------------------|------------------------|-----------------------------|----------------------------|----------------------|
| 1 | 4.0-A | 356A | 357A | 45.0 | 18.0 | 0 | 3.0 |
| 2 | 3.6-B | 283B | 291B | 95.0 | 71.0 | 12.0 | 1.0 |
| 3 | 3.2-B | 289W | 295B | 85.0 | 57.0 | 6.0 | 6 |
| 4 | 4.0-A | 345A | 357A | 43.0 | 20.0 | 1.0 | 21 |
| 5 | 3.6-B | 285B | 288B | 80.0 | 68.0 | 8.0 | 2 |
| 6 | 3.4-B | 330W | 339A | 24.0 | 16.0 | 2.0 | 12.0 |
| 7 | 3.4-B | 270B | 280B | 99.0 | 83.0 | 10.0 | 2.0 |
| 8 | 3.7-B | 272B | 286B | 99.0 | 92.0 | 8.0 | 2.0 |
| 9 | 3.8A | 272B | 290B | 92.0 | 82.0 | 10.0 | 1.0 |
| 10 | 3.6-B | 330W | 340A | 32.0 | 20.0 | 4.0 | 4.0 |
| 11 | 4.2-A | 341A | 351A | 32.0 | 14.0 | 1.0 | 17.0 |

A= above 1 Standard Deviation, B= below 1 Standard Deviation, W= Within 1 Standard Deviation

*High School SEQ Scores, FCAT Math and Reading Scores and Demographic Data With
Deviation From Mean Indicators*

| School Number | Mean SEQ score | FCAT Reading Weighted Means | FCAT Math Weighted Means | % of Minority Students | % of Free and Reduced Lunch | % Out of School Suspension | % of Gifted Students |
|---------------|----------------|-----------------------------|--------------------------|------------------------|-----------------------------|----------------------------|----------------------|
| 1 | 4.1-A | 364-A | 354-A | 33.0 | 11.0 | 2.0 | 25.0 |
| 2 | 3.4-B | 268-B | 284-B | 88.0 | 43 | 21 | 1 |
| 3 | 3.3-B | 267-B | 287-B | 99.0 | 88.0 | 25.0 | 4.0 |
| 4 | 4.0-A | 282-B | 301-W | 77.0 | 44.0 | 11.0 | 1.0 |
| 5 | 3.4-B | 275-B | 289-B | 96.0 | 54.0 | 29.0 | 2.0 |
| 6 | 3.9-A | 363-A | 364-A | 54.0 | 15.0 | 3.0 | 27.0 |

A= above 1 Standard Deviation, B= below 1 Standard Deviation, W= Within 1 Standard Deviation

APPENDIX B

SEQ:TV Survey Items

SCHOOL EFFECTIVENESS QUESTIONNAIRE: TEACHER/STAFF VERSION

ITEMS AND CORRELATES

INSTRUCTIONAL LEADERSHIP

1. Administrators are knowledgeable of the school and district curriculum.
2. Frequent communication occurs between faculty and administration.
3. Instructional decisions for the school are based on community, teacher, and central administration input.
4. The principal is involved in the instructional process.
5. The principal and teachers make instructional effectiveness the highest priority in the school.
6. The principal assumes leadership for improving the instructional program.
7. Administrators complete fair and meaningful evaluations of each employee.
8. The principal encourages teachers to participate in leadership roles.
57. Professional development is tailored to the needs of the school.
58. Teachers are involved in planning and evaluating professional development activities.
59. The importance of professional development is emphasized.
60. The application of professional development activities is encouraged.
61. Feedback is sought from participants in professional development activities.
62. Teachers strive to maintain and enhance their professional status.
63. Teachers are involved in school planning and budgeting.
64. Teachers are involved in developing and reviewing the school's mission and goals.
65. Teachers are involved in monitoring the implementation of school policies and procedures.
66. Teachers perceive that they can influence school decisions.
67. Teachers and administrators function as a team.

CLEAR and FOCUSED MISSION

- 9 A school plan for the year exists which includes goals and objectives.
10. The school plan is developed with teachers and community members.
11. Important social trends are considered in school planning.
12. Teachers and students are aware of school purposes and goals.
13. The goals of teachers are consistent with school and district goals.
14. Teachers communicate instructional goals to students.
15. The school plan is revised, monitored, and reviewed periodically.
64. Teachers are involved in developing and reviewing the school's mission and goals.

POSITIVE SCHOOL CLIMATE

16. School conduct rules and procedures are taught along with other skills.
17. Disciplinary procedures are implemented in a fair and consistent manner.

18. Parents are involved in and support school discipline practices.
19. The physical plant is clean and well maintained.
20. Appropriate safety principles are taught and practiced.
21. An atmosphere of respect and trust exists.
22. Social and cultural differences are respected.
23. Students and teachers have a positive attitude toward school.
24. Teacher and student attendance is high.
25. Students and teachers are recognized for their accomplishments.
26. Teachers, students, and administrators assume responsibility, as appropriate, for the physical appearance of the school.
27. School facilities contribute to a positive school climate.
56. Professional development addresses the social and cultural differences in the school.

HIGH EXPECTATIONS

28. Expectations are high, appropriate, and achievable.
29. Expectations are communicated to faculty, support staff, students, and parents.
30. Success is expected of all students regardless of social or cultural differences.
31. Expectations for students are based on knowledge of students and their previous performance.
32. High expectations are consistently maintained over time.

FREQUENT MONITORING OF STUDENT PROGRESS

33. Student performance is regularly monitored.
34. Student performance is monitored in a variety of ways.
35. Assessment data are used to improve the school's program.
36. Student progress is regularly reported to parents.
37. Student assessment data are monitored to modify instruction to promote student learning.
38. Students are regularly informed of their progress.
39. Basic skills are defined as including minimum student performance standards, grade appropriate skills within content areas, critical/higher order thinking skills, and problem-solving skills. Basic skills in my school fit this definition.
40. Students are taught to apply basic skills.
41. Basic skills are assessed for content and process application.
42. Electives and "specials" are integrated into the school curriculum.
43. The integration of basic skills into instruction is consistently monitored.

TIME ON TASK

44. Appropriate instructional time is maximized.
45. Disruptions to instruction are minimized.
46. Transitions are effectively managed.
47. Extracurricular and supplemental activities support instruction.

- 48. The curriculum is varied to accommodate needs, interests, and abilities of students.
- 49. Cooperative learning opportunities are provided.

POSITIVE HOME/SCHOOL RELATIONS

- 50. Parents actively participate in establishing school policies and procedures.
- 51. Parents actively participate in school activities.
- 52. Effective and frequent communication occurs with parents.
- 53. Community resources are used to support the school's program.
- 54. Social services from available outside agencies are effectively utilized.
- 55. Parents are encouraged to support the instructional activities of the school.

APPENDIX C

Formulas for Calculating High School Math Mean

Scale Scores in Microsoft Access

Formulas for Calculating High School Math Mean

Scale Scores in Microsoft Access

The following formulas were developed to process the data in Microsoft Access for high schools:

Weighted FCAT Math Mean Score: $\text{Round}(\frac{[10\text{th Grade Math}]![\text{Number of Students}] * [10\text{th Grade Math}]![\text{Mean Scale Score (100-500)}] + [9\text{th Grade Math}]![\# \text{ of Students}] * [9\text{th Grade Math}]![\text{Mean Scale}]}{[9\text{th Grade Math}]![\# \text{ of Students}] + [10\text{th Grade Math}]![\text{Number of Students}]}, 0)$

Formula for Calculating High School Reading Mean Scale Scores in Microsoft Access

Weighted FCAT Reading Mean Scale Score: $\text{Round}(\frac{[10\text{th Grade Reading}]![\text{Number of Students}] * [10\text{th Grade Reading}]![\text{Mean Scale Score (100-500)}] + [9\text{th Grade Reading}]![\text{Number of Students}] * [9\text{th Grade Reading}]![\text{Mean Scale Score (100-500)}]}{[9\text{th Grade Reading}]![\text{Number of Students}] + [10\text{th Grade Reading}]![\text{Number of Students}]}, 0)$

To calculate all other school levels and test types, the fields specific to those attributes were modified accordingly. Once these calculations were run, the Access queries saved as tables were converted to Excel spreadsheets.

APPENDIX D

Mean SEQ:TV Dimension and Cumulative School Scores

With Weighted FCAT Math and Reading Scores

*Palm Beach County Elementary School Mean SEQ Dimension Scores and Weighted
FCAT Math and Reading Scale Scores*

| Level | School Number | Positive School Climate | High Expectations | Frequently Monitor Student Progress | Time On Task | Positive Home/School Relations | Instructional Leadership | Clear Focused Mission | Mean SEQ Score | Weighted Reading Means | Weighted Math Means |
|-------|---------------|-------------------------|-------------------|-------------------------------------|--------------|--------------------------------|--------------------------|-----------------------|----------------|------------------------|---------------------|
| 1 | 1 | 3.6 | 3.9 | 4.0 | 3.7 | 3.8 | 3.7 | 3.9 | 3.8 | 332 | 345 |
| 1 | 2 | 3.9 | 4.2 | 4.3 | 4.1 | 4.1 | 3.8 | 4.1 | 4.0 | 351 | 367 |
| 1 | 3 | 4.3 | 4.5 | 4.5 | 4.4 | 4.2 | 4.4 | 4.5 | 4.4 | 320 | 340 |
| 1 | 4 | 4.2 | 4.4 | 4.3 | 4.2 | 4.3 | 4.2 | 4.3 | 4.3 | 322 | 326 |
| 1 | 5 | 3.5 | 4.1 | 4.0 | 3.7 | 3.7 | 3.9 | 4.0 | 3.8 | 285 | 309 |
| 1 | 6 | 4.7 | 4.8 | 4.8 | 4.7 | 4.7 | 4.7 | 4.8 | 4.7 | 358 | 373 |
| 1 | 7 | 3.7 | 4.1 | 4.2 | 3.9 | 3.7 | 3.9 | 4.1 | 3.9 | 277 | 295 |
| 1 | 8 | 4.7 | 4.8 | 4.9 | 4.7 | 4.6 | 4.7 | 4.8 | 4.7 | 304 | 326 |
| 1 | 9 | 3.9 | 4.2 | 4.3 | 4.2 | 3.6 | 4.1 | 4.2 | 4.1 | 291 | 311 |
| 1 | 10 | 4.1 | 4.2 | 4.3 | 4.1 | 3.7 | 3.9 | 4.1 | 4.0 | 291 | 316 |
| 1 | 11 | 4.4 | 4.6 | 4.7 | 4.5 | 4.5 | 4.1 | 4.5 | 4.4 | 356 | 372 |
| 1 | 12 | 3.6 | 3.9 | 4.3 | 4.1 | 3.3 | 3.4 | 4.0 | 3.8 | 306 | 323 |
| 1 | 13 | 4.1 | 4.3 | 4.4 | 4.2 | 4.3 | 4.1 | 4.3 | 4.2 | 324 | 341 |
| 1 | 14 | 3.7 | 4.0 | 4.2 | 4.1 | 3.5 | 3.8 | 4.0 | 3.9 | 299 | 314 |
| 1 | 15 | 4.2 | 4.6 | 4.6 | 4.4 | 4.3 | 4.5 | 4.6 | 4.5 | 333 | 351 |
| 1 | 16 | 4.1 | 4.3 | 4.3 | 4.2 | 4.1 | 4.1 | 4.3 | 4.2 | 336 | 353 |
| 1 | 17 | 3.3 | 3.7 | 4.0 | 3.8 | 3.4 | 3.4 | 3.8 | 3.6 | 313 | 327 |
| 1 | 18 | 3.6 | 3.8 | 4.0 | 3.7 | 3.5 | 3.5 | 3.7 | 3.7 | 295 | 302 |
| 1 | 19 | 4.1 | 4.3 | 4.3 | 4.2 | 4.0 | 4.0 | 4.2 | 4.1 | 324 | 340 |
| 1 | 20 | 4.1 | 4.4 | 4.4 | 4.2 | 3.9 | 4.2 | 4.3 | 4.2 | 319 | 336 |
| 1 | 21 | 4.3 | 4.6 | 4.6 | 4.6 | 4.5 | 4.4 | 4.5 | 4.5 | 357 | 381 |
| 1 | 22 | 4.4 | 4.6 | 4.6 | 4.5 | 4.1 | 4.3 | 4.5 | 4.4 | 306 | 329 |
| 1 | 23 | 3.9 | 4.1 | 4.2 | 4.0 | 4.0 | 3.9 | 4.0 | 4.0 | 324 | 335 |
| 1 | 24 | 3.6 | 3.9 | 3.9 | 3.7 | 3.2 | 3.8 | 3.8 | 3.7 | 269 | 293 |
| 1 | 25 | 4.1 | 4.5 | 4.5 | 4.2 | 3.9 | 4.5 | 4.6 | 4.3 | 284 | 316 |

(continued)

| | | | | | | | | | | | |
|---|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1 | 26 | 4.7 | 4.9 | 4.9 | 4.8 | 4.7 | 4.8 | 4.8 | 4.8 | 324 | 342 |
| 1 | 27 | 4.4 | 4.5 | 4.5 | 4.4 | 4.3 | 4.4 | 4.4 | 4.4 | 331 | 348 |
| 1 | 28 | 3.7 | 4.0 | 4.1 | 3.9 | 3.4 | 3.8 | 3.9 | 3.8 | 293 | 311 |
| 1 | 29 | 3.1 | 3.7 | 3.9 | 3.3 | 2.9 | 3.5 | 3.6 | 3.4 | 269 | 297 |
| 1 | 30 | 4.2 | 4.3 | 4.4 | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 312 | 328 |
| 1 | 31 | 4.2 | 4.5 | 4.5 | 4.3 | 4.2 | 4.3 | 4.4 | 4.3 | 336 | 359 |
| 1 | 32 | 3.7 | 4.2 | 4.3 | 4.1 | 3.4 | 3.9 | 4.0 | 3.9 | 278 | 295 |
| 1 | 33 | 4.1 | 4.3 | 4.3 | 4.2 | 4.0 | 4.3 | 4.4 | 4.3 | 298 | 332 |
| 1 | 34 | 4.1 | 4.3 | 4.4 | 4.2 | 4.2 | 4.2 | 4.4 | 4.2 | 326 | 336 |
| 1 | 35 | 3.8 | 4.2 | 4.2 | 4.1 | 3.8 | 4.0 | 4.1 | 4.0 | 293 | 313 |
| 1 | 36 | 3.9 | 4.2 | 4.4 | 4.1 | 3.8 | 4.1 | 4.3 | 4.1 | 298 | 313 |
| 1 | 37 | 4.6 | 4.8 | 4.7 | 4.6 | 4.6 | 4.7 | 4.8 | 4.7 | 291 | 322 |
| 1 | 38 | 3.4 | 3.9 | 4.0 | 3.7 | 3.1 | 3.9 | 3.9 | 3.7 | 285 | 297 |
| 1 | 39 | 4.5 | 4.7 | 4.7 | 4.6 | 4.6 | 4.7 | 4.7 | 4.6 | 339 | 349 |
| 1 | 40 | 4.3 | 4.4 | 4.5 | 4.4 | 4.3 | 4.3 | 4.4 | 4.3 | 317 | 338 |
| 1 | 41 | 4.2 | 4.4 | 4.3 | 4.2 | 4.2 | 4.2 | 4.3 | 4.2 | 318 | 331 |
| 1 | 42 | 3.8 | 3.9 | 4.1 | 3.8 | 3.4 | 3.7 | 3.9 | 3.8 | 293 | 315 |
| 1 | 43 | 4.2 | 4.4 | 4.4 | 4.3 | 4.2 | 4.2 | 4.2 | 4.3 | 303 | 320 |
| 1 | 44 | 3.7 | 4.2 | 4.1 | 3.8 | 3.2 | 3.7 | 4.1 | 3.8 | 280 | 304 |
| 1 | 45 | 3.9 | 4.2 | 4.3 | 4.1 | 3.6 | 4.1 | 4.2 | 4.1 | 292 | 318 |
| 1 | 46 | 3.9 | 3.9 | 4.3 | 4.1 | 3.9 | 3.7 | 4.2 | 3.9 | 320 | 345 |
| 1 | 47 | 4.6 | 4.7 | 4.7 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 347 | 362 |
| 1 | 48 | 4.2 | 4.3 | 4.4 | 4.2 | 4.2 | 4.2 | 4.4 | 4.3 | 318 | 341 |
| 1 | 49 | 4.1 | 4.5 | 4.6 | 4.4 | 4.4 | 4.4 | 4.6 | 4.4 | 345 | 360 |
| 1 | 50 | 4.2 | 4.3 | 4.4 | 4.3 | 4.0 | 3.9 | 4.0 | 4.1 | 281 | 313 |
| 1 | 51 | 3.9 | 4.1 | 4.1 | 3.9 | 3.7 | 3.9 | 4.0 | 4.0 | 294 | 313 |
| 1 | 52 | 3.8 | 4.3 | 4.3 | 4.1 | 3.8 | 3.8 | 4.2 | 4.0 | 305 | 330 |
| 1 | 53 | 4.2 | 4.5 | 4.4 | 4.3 | 4.3 | 4.3 | 4.4 | 4.3 | 339 | 354 |
| 1 | 54 | 3.4 | 3.7 | 3.7 | 3.5 | 3.1 | 3.6 | 3.5 | 3.5 | 264 | 271 |
| 1 | 55 | 4.2 | 4.5 | 4.6 | 4.4 | 4.1 | 4.3 | 4.5 | 4.4 | 322 | 336 |
| 1 | 56 | 4.0 | 4.4 | 4.4 | 4.3 | 4.2 | 4.0 | 4.3 | 4.2 | 339 | 355 |
| 1 | 57 | 4.0 | 4.2 | 4.3 | 4.1 | 3.9 | 3.9 | 4.2 | 4.1 | 313 | 333 |
| 1 | 58 | 4.0 | 4.3 | 4.3 | 4.2 | 3.7 | 4.1 | 4.2 | 4.1 | 295 | 310 |
| 1 | 59 | 4.2 | 4.2 | 4.4 | 4.2 | 4.3 | 4.0 | 4.3 | 4.2 | 341 | 351 |
| 1 | 60 | 4.0 | 4.3 | 4.5 | 4.2 | 4.4 | 4.2 | 4.4 | 4.3 | 329 | 339 |
| 1 | 61 | 4.3 | 4.4 | 4.3 | 4.3 | 4.1 | 4.3 | 4.3 | 4.3 | 310 | 327 |
| 1 | 62 | 4.3 | 4.6 | 4.6 | 4.4 | 4.2 | 4.4 | 4.5 | 4.4 | 304 | 326 |
| 1 | 63 | 4.1 | 4.4 | 4.4 | 4.2 | 3.9 | 4.2 | 4.2 | 4.2 | 312 | 332 |
| 1 | 64 | 4.8 | 4.9 | 4.9 | 4.9 | 4.6 | 4.8 | 4.8 | 4.8 | 283 | 320 |
| 1 | 65 | 3.1 | 3.3 | 3.7 | 3.4 | 2.5 | 2.9 | 3.4 | 3.2 | 285 | 308 |
| 1 | 66 | 4.1 | 4.5 | 4.5 | 4.1 | 3.7 | 4.5 | 4.6 | 4.3 | 270 | 297 |
| 1 | 67 | 3.8 | 4.1 | 4.3 | 3.9 | 4.0 | 3.9 | 4.3 | 4.0 | 325 | 341 |

(continued)

| | | | | | | | | | | | |
|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1 | 68 | 4.2 | 4.5 | 4.5 | 4.4 | 4.2 | 4.1 | 4.2 | 4.3 | 314 | 342 |
| 1 | 69 | 4.0 | 4.3 | 4.4 | 4.2 | 3.7 | 4.4 | 4.4 | 4.2 | 285 | 306 |
| 1 | 70 | 3.9 | 4.2 | 4.2 | 4.1 | 3.8 | 4.1 | 4.2 | 4.1 | 292 | 316 |
| 1 | 71 | 4.0 | 4.3 | 4.3 | 4.0 | 3.9 | 4.0 | 4.2 | 4.1 | 342 | 360 |
| 1 | 72 | 4.2 | 4.4 | 4.3 | 4.2 | 4.2 | 4.3 | 4.3 | 4.3 | 328 | 343 |
| 1 | 73 | 3.7 | 4.1 | 4.2 | 4.0 | 3.4 | 3.9 | 4.1 | 3.9 | 279 | 319 |
| 1 | 74 | 3.6 | 4.1 | 4.0 | 3.7 | 3.6 | 3.8 | 3.9 | 3.8 | 295 | 314 |
| 1 | 75 | 3.2 | 4.1 | 4.1 | 3.6 | 2.6 | 3.3 | 3.7 | 3.5 | 286 | 309 |
| 1 | 76 | 4.4 | 4.6 | 4.6 | 4.4 | 4.0 | 4.5 | 4.4 | 4.5 | 286 | 304 |
| 1 | 77 | 4.4 | 4.5 | 4.5 | 4.4 | 4.3 | 4.5 | 4.4 | 4.5 | 304 | 317 |
| 1 | 78 | 4.2 | 4.5 | 4.6 | 4.4 | 4.0 | 4.4 | 4.6 | 4.4 | 283 | 300 |
| 1 | 79 | 4.0 | 4.2 | 4.3 | 4.0 | 3.8 | 4.1 | 4.2 | 4.1 | 278 | 293 |
| 1 | 80 | 3.9 | 4.2 | 4.2 | 4.0 | 3.8 | 4.2 | 4.2 | 4.1 | 292 | 311 |
| 1 | 81 | 4.3 | 4.5 | 4.5 | 4.4 | 4.2 | 4.4 | 4.5 | 4.4 | 320 | 332 |
| 1 | 82 | 3.8 | 3.9 | 4.0 | 3.9 | 3.9 | 3.8 | 4.0 | 3.9 | 322 | 334 |
| 1 | 83 | 4.0 | 4.3 | 4.3 | 4.2 | 4.0 | 4.2 | 4.4 | 4.2 | 329 | 348 |
| 1 | 84 | 4.1 | 4.3 | 4.4 | 4.3 | 4.0 | 4.3 | 4.3 | 4.2 | 310 | 326 |
| 1 | 85 | 4.0 | 4.3 | 4.3 | 4.2 | 3.9 | 4.2 | 4.2 | 4.1 | 282 | 306 |
| 1 | 86 | 4.2 | 4.3 | 4.3 | 4.2 | 4.1 | 4.1 | 4.2 | 4.2 | 332 | 343 |
| 1 | 87 | 4.1 | 4.4 | 4.5 | 4.2 | 3.8 | 4.4 | 4.5 | 4.3 | 288 | 298 |
| 1 | 88 | 4.4 | 4.6 | 4.6 | 4.4 | 4.4 | 4.3 | 4.5 | 4.4 | 336 | 360 |
| 1 | 89 | 4.0 | 4.6 | 4.6 | 4.4 | 4.3 | 4.3 | 4.5 | 4.3 | 339 | 353 |
| 1 | 90 | 4.1 | 4.5 | 4.5 | 4.2 | 4.1 | 4.3 | 4.4 | 4.3 | 307 | 321 |
| 1 | 91 | 4.2 | 4.5 | 4.5 | 4.4 | 4.2 | 4.3 | 4.4 | 4.3 | 336 | 358 |
| 1 | 92 | 3.8 | 4.2 | 4.2 | 3.9 | 3.8 | 4.0 | 4.0 | 4.0 | 280 | 299 |
| 1 | 93 | 3.4 | 3.9 | 4.0 | 3.8 | 3.2 | 3.7 | 4.0 | 3.7 | 290 | 308 |
| 1 | 94 | 4.0 | 4.3 | 4.4 | 4.2 | 4.3 | 4.1 | 4.3 | 4.2 | 357 | 378 |
| 1 | 95 | 4.1 | 4.5 | 4.5 | 4.3 | 4.2 | 4.2 | 4.4 | 4.3 | 331 | 349 |
| 1 | 96 | 3.9 | 4.4 | 4.5 | 4.3 | 3.7 | 4.3 | 4.3 | 4.2 | 282 | 301 |
| 1 | 97 | 3.0 | 3.5 | 3.8 | 3.1 | 2.7 | 3.2 | 3.4 | 3.2 | 270 | 290 |
| 1 | 98 | 4.0 | 4.2 | 4.3 | 4.0 | 3.9 | 4.2 | 4.2 | 4.1 | 279 | 302 |
| 1 | 99 | 3.6 | 3.8 | 4.2 | 3.9 | 3.8 | 3.9 | 3.9 | 3.9 | 320 | 331 |
| 1 | 100 | 4.6 | 4.7 | 4.7 | 4.6 | 4.4 | 4.5 | 4.7 | 4.6 | 309 | 335 |

$N = 100$

*Palm Beach County Middle School Mean SEQ Dimension Scores and
Weighted FCAT Math and Reading Scale Scores*

| Level | School Number | Positive School Climate | High Expectations | Frequently Monitor Student Progress | Time On Task | Positive Home/School Relations | Instructional Leadership | Clear Focused Mission | Mean SEQ Score | Weighted Reading Means | Weighted Math Means |
|-------|---------------|-------------------------|-------------------|-------------------------------------|--------------|--------------------------------|--------------------------|-----------------------|----------------|------------------------|---------------------|
| 2 | 1 | 4.0 | 4.3 | 4.4 | 4.2 | 4.2 | 3.7 | 4.1 | 4.0 | 356 | 357 |
| 2 | 2 | 3.4 | 3.7 | 3.7 | 3.5 | 3.5 | 3.6 | 3.6 | 3.6 | 283 | 291 |
| 2 | 3 | 3.5 | 3.7 | 4.0 | 3.5 | 3.6 | 3.6 | 3.7 | 3.7 | 311 | 315 |
| 2 | 4 | 3.8 | 4.0 | 4.2 | 3.9 | 3.8 | 4.0 | 4.1 | 4.0 | 327 | 331 |
| 2 | 5 | 2.9 | 3.2 | 3.6 | 3.3 | 2.9 | 3.0 | 3.4 | 3.2 | 289 | 295 |
| 2 | 6 | 3.9 | 4.2 | 4.2 | 4.0 | 3.6 | 4.1 | 4.2 | 4.1 | 288 | 297 |
| 2 | 7 | 4.1 | 4.3 | 4.3 | 4.2 | 3.9 | 4.2 | 4.2 | 4.2 | 317 | 323 |
| 2 | 8 | 3.9 | 4.3 | 4.3 | 4.0 | 3.9 | 3.8 | 3.9 | 4.0 | 345 | 357 |
| 2 | 9 | 3.8 | 4.0 | 4.2 | 3.8 | 3.8 | 3.7 | 4.0 | 3.9 | 323 | 335 |
| 2 | 10 | 3.2 | 3.7 | 3.9 | 3.3 | 3.3 | 3.7 | 3.9 | 3.6 | 285 | 288 |
| 2 | 11 | 3.1 | 3.5 | 3.8 | 3.3 | 3.4 | 3.1 | 3.6 | 3.4 | 330 | 339 |
| 2 | 12 | 3.4 | 4.0 | 4.0 | 3.6 | 3.1 | 3.4 | 3.7 | 3.6 | 290 | 300 |
| 2 | 13 | 3.2 | 3.7 | 3.7 | 3.3 | 3.2 | 3.4 | 3.7 | 3.4 | 270 | 280 |
| 2 | 14 | 3.7 | 4.1 | 4.2 | 4.0 | 4.0 | 3.8 | 4.0 | 3.9 | 328 | 335 |
| 2 | 15 | 4.3 | 4.6 | 4.5 | 4.4 | 4.1 | 4.5 | 4.4 | 4.4 | 288 | 305 |
| 2 | 16 | 3.4 | 4.0 | 4.1 | 3.6 | 3.4 | 3.8 | 4.0 | 3.7 | 272 | 286 |
| 2 | 17 | 3.7 | 4.0 | 4.2 | 3.9 | 3.4 | 3.8 | 3.8 | 3.8 | 272 | 290 |
| 2 | 18 | 4.1 | 4.2 | 4.3 | 4.1 | 3.9 | 4.3 | 4.3 | 4.2 | 295 | 303 |
| 2 | 19 | 3.6 | 4.1 | 4.0 | 3.9 | 4.0 | 3.8 | 3.9 | 3.8 | 323 | 331 |
| 2 | 20 | 3.2 | 3.5 | 3.8 | 3.5 | 2.7 | 3.3 | 3.6 | 3.4 | 295 | 311 |
| 2 | 21 | 3.7 | 4.0 | 4.1 | 4.0 | 3.6 | 3.8 | 3.9 | 3.9 | 297 | 304 |
| 2 | 22 | 3.5 | 3.7 | 4.0 | 3.7 | 3.7 | 3.5 | 3.6 | 3.6 | 330 | 340 |
| 2 | 23 | 4.4 | 4.6 | 4.6 | 4.6 | 4.4 | 4.5 | 4.6 | 4.5 | 322 | 322 |
| 2 | 24 | 3.6 | 4.0 | 4.1 | 3.9 | 3.7 | 3.7 | 3.8 | 3.8 | 323 | 332 |
| 2 | 25 | 3.6 | 4.1 | 4.2 | 3.8 | 3.8 | 3.9 | 4.0 | 3.9 | 307 | 310 |

(continued)

| | | | | | | | | | | | |
|---|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2 | 26 | 4.0 | 4.2 | 4.2 | 4.0 | 3.7 | 3.9 | 4.1 | 4.0 | 300 | 304 |
| 2 | 27 | 3.5 | 3.9 | 3.9 | 3.7 | 3.7 | 3.8 | 3.8 | 3.7 | 315 | 324 |
| 2 | 28 | 4.1 | 4.3 | 4.3 | 4.0 | 4.1 | 4.1 | 4.2 | 4.2 | 341 | 351 |
| 2 | 29 | 3.8 | 4.0 | 4.1 | 3.9 | 3.8 | 4.0 | 4.0 | 4.0 | 315 | 325 |
| 2 | 30 | 3.4 | 3.9 | 4.1 | 3.6 | 3.6 | 3.7 | 3.8 | 3.7 | 318 | 326 |

$N = 30$

*Palm Beach County High School Mean SEQ Dimension Scores and
Weighted FCAT Math and Reading Scale Scores*

| Level | School Number | Positive School Climate | High Expectations | Frequently Monitor Student Progress | Time On Task | Positive Home/School Relations | Instructional Leadership | Clear Focused Mission | Mean SEQ score | FCAT Reading Weighted Means | FCAT Math Weighted Means |
|-------|---------------|-------------------------|-------------------|-------------------------------------|--------------|--------------------------------|--------------------------|-----------------------|----------------|-----------------------------|--------------------------|
| 3 | 1 | 4.0 | 4.3 | 4.3 | 4.2 | 4.2 | 3.9 | 4.2 | 4.1 | 364 | 354 |
| 3 | 2 | 4.1 | 4.3 | 4.3 | 4.1 | 3.9 | 4.1 | 4.2 | 4.1 | 306 | 313 |
| 3 | 3 | 4.0 | 4.3 | 4.3 | 4.1 | 4.0 | 4.1 | 4.1 | 4.1 | 326 | 336 |
| 3 | 4 | 3.2 | 3.6 | 3.8 | 3.4 | 3.0 | 3.4 | 3.5 | 3.4 | 268 | 284 |
| 3 | 5 | 4.0 | 4.1 | 4.2 | 4.1 | 3.9 | 4.0 | 4.1 | 4.0 | 290 | 307 |
| 3 | 6 | 3.1 | 3.5 | 3.8 | 3.4 | 3.0 | 3.2 | 3.5 | 3.3 | 267 | 287 |
| 3 | 7 | 3.9 | 4.1 | 4.3 | 4.0 | 3.6 | 4.0 | 4.2 | 4.0 | 282 | 301 |
| 3 | 8 | 3.7 | 4.1 | 4.2 | 3.9 | 4.0 | 3.8 | 4.0 | 3.9 | 329 | 335 |
| 3 | 9 | 3.9 | 4.3 | 4.4 | 4.2 | 3.8 | 4.1 | 4.2 | 4.1 | 286 | 300 |
| 3 | 10 | 3.9 | 4.2 | 4.3 | 3.9 | 3.9 | 4.0 | 4.1 | 4.0 | 312 | 325 |
| 3 | 11 | 3.9 | 4.1 | 4.2 | 4.1 | 3.7 | 3.9 | 4.0 | 4.0 | 313 | 324 |
| 3 | 12 | 3.9 | 4.3 | 4.3 | 4.1 | 3.8 | 4.1 | 4.2 | 4.1 | 296 | 310 |
| 3 | 13 | 3.1 | 3.5 | 3.7 | 3.5 | 3.1 | 3.3 | 3.6 | 3.4 | 275 | 289 |
| 3 | 14 | 4.2 | 4.5 | 4.5 | 4.3 | 4.1 | 4.3 | 4.3 | 4.3 | 325 | 333 |
| 3 | 15 | 3.3 | 3.7 | 3.9 | 3.6 | 3.3 | 3.6 | 3.8 | 3.6 | 293 | 305 |
| 3 | 16 | 3.7 | 3.9 | 4.0 | 3.7 | 3.4 | 3.6 | 3.8 | 3.7 | 292 | 300 |
| 3 | 17 | 3.4 | 3.7 | 4.0 | 3.7 | 3.6 | 3.4 | 3.6 | 3.5 | 317 | 324 |
| 3 | 18 | 3.9 | 4.1 | 4.2 | 3.8 | 4.0 | 3.8 | 4.1 | 4.0 | 335 | 339 |
| 3 | 19 | 3.8 | 4.2 | 4.1 | 3.9 | 3.8 | 3.8 | 3.9 | 3.9 | 363 | 364 |
| 3 | 20 | 3.8 | 4.1 | 4.0 | 3.7 | 3.8 | 3.9 | 3.9 | 3.9 | 330 | 336 |
| 3 | 21 | 4.6 | 4.7 | 4.7 | 4.7 | 4.7 | 4.6 | 4.7 | 4.7 | 322 | 331 |
| 3 | 22 | 3.6 | 4.0 | 4.1 | 3.8 | 3.6 | 3.7 | 3.9 | 3.8 | 308 | 323 |

N = 22

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