ORGANIZATIONAL CLIMATE AND STUDENT ACHIEVEMENT IN BELIZEAN SECONDARY SCHOOLS

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DEDICATION

In loving memory of my dear beloved mother. May she rest in peace with the knowledge that she was truly an inspiration. I thank her dearly for having taught me to have faith both in God and myself.

To my soul mate, Mitchell—you were there through all my ups and downs and you never complained. You really gave unselfishly and for that I am truly grateful.

To my little angels Denvor and Deanni—you have been my encouragement. I hope that I have inspired in you the joy of reading after seeing me among books and papers for countless hours.

Finally, I could not have done any of this without God so I thank Him for bestowing on me all these blessings. My service to Him and others must never cease.

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CHAPTER 1

Educational institutions have always been under the critical microscope of an ever-demanding society. As stakeholders clamor for quality education, school leaders often exert efforts into responsive mechanisms that could lead to school improvement and increased student performance. The Belizean educational system is no exception to societal pressures for improved student performance; thus, school leaders in Belize often search for ways of meeting the demands of an ever-changing society. Success in national and regional exams remains one of the priorities of the Belizean educational system. In the midst of the global movement toward higher quality in education, Belizean educators continuously seek best practices to ensure that there is an environment of academic excellence in the classrooms.

Secondary schools in Belize play the crucial role of educating the adolescents in the country. These schools exist in the form of government schools, government-aided community schools, government-aided denominational schools and private/specially assisted schools. Students who attend secondary schools are given the opportunity to sit for regional exams known as Caribbean Secondary Education Certificate (CSEC) exams. These standardized exams are given yearly in the Caribbean to high school students and focus on a variety of subjects that the students take while attending secondary school.

As with any educational system, some secondary schools in Belize perform better on these exams than others. A closer look at this situation quickly reveals that in the

classroom there are disparities in academic achievement. Differences in academic achievement may exist for varying reasons, one of which is differences in cognitive ability. It is informative to note, however, that the latter only accounts for a portion of the disparity in academic achievement. Educational researchers believe many factors other than academic abilities affect academic achievement. These factors are often external to the individual and include school and environmental characteristics. Some of these correlates include socioeconomic status (Barton, 2004; Klinger, 2000;Willie, 2001), parental involvement (Barnard, 2004; Evans, Shaw & Bell, 2000; Fan & Chen, 2001; Okpala, Okpala & Smith, 2001; Strayhorn, 2010; Wu & Qi, 2006), principal leadership style (Blase & Blase, 2000; Goleman, 2006; Hallinger, 2003), teacher and student engagement (Bryson & Hand, 2007; Cawelti, 2000) and method of instruction (Miller & Calfee, 2004; Rumberger & Thomas, 2000).

A number of factors affect academic achievement, and recently, a growing body of literature has indicated that yet another school factor, school climate, affects student academic achievement. Studies have shown that there is a positive relationship between organizational school climate and student academic achievement (Goddard, Sweetland & Hoy, 2000; Heck, 2000; Smith, 2002; Uline & Tschannen-Moran, 2008).

School climate studies provide useful information for school administrators who are interested in building healthy relations in their schools. For these leaders who seek innovative ways of improving their school environment and, thus, the academic success of their students, school climate studies merit some attention. This study, in particular, provides further insights on the topic of school climate as it focuses on the relationship between organizational climate and academic achievement in secondary schools.

Statement of the Problem

Early studies on student academic achievement primarily focused on the effects of socioeconomic status. The research literature has shown that this factor is correlated with student achievement and does have some effect on the latter (Barton, 2004; Klinger, 2000; Malecki & Demaray, 2006; Willie, 2001).

Other studies, however, have provided evidence indicating that socioeconomic status is not the major factor affecting student achievement. Additional external factors have been identified as playing important roles in determining academic success (Barnard, 2004; Oppdenaker & Damme, 2001; Uline & Tschannen-Moran, 2008). This study ~~inv~~estigates how one such factor—organizational school climate—affects student achievement in the Belizean educational context. It seeks to find out whether school climate nurtures proficiency in Mathematics in Belizean secondary schools.

Purpose of the Study

The purpose of this study was to determine if a relationship exists between organizational school climate and student achievement in Belizean secondary schools, and to explore whether the various factors of school climate have independent effects on math achievement. School climate was measured using the School Climate Index (SCI) developed by Tschannen-Moran, Parish and Dipaola (2006). This instrument looks at four aspects of the organization: collegial leadership, teacher professionalism, academic press, and community engagement. Student achievement was measured using test scores from the Caribbean Secondary Education Certificate Exams (CSEC). Test scores of students who sat the Math CSEC exam in 2010 were used.

This study built upon one conducted in the United States in 2006 on school climate and student achievement using the same instrument. The current study examined the same relationship, but in the setting of a developing country. School climate literature should be expanded as it allows educators access to valuable information on what factors affect student achievement. As educators develop school improvement plans, they can use such information in their planning to make schools more effective.

Research Questions

The following questions were addressed in this study:

1. What is the relationship between overall organizational climate, as measured by the SCI, and overall student achievement on the CSEC Math exams in Belizean secondary schools?
2. What is the relative weight of each of the factors of school organizational climate—collegial leadership, teacher professionalism, academic press, and community engagement— in relation to student achievement on the CSEC Math exams?

Hypotheses Statements

The following null hypotheses were developed to guide this research:

H_{O1}: There is no significant relationship between overall teachers' perceptions of organizational climate, as measured by the SCI, and overall student achievement scores as measured by the 2010 CSEC Mathematics exam in Belizean secondary schools.

H_{O2}: There are no significant independent effects of each of the school climate factors—collegial leadership, teacher professionalism, academic press, and

community engagement— on student achievement as measured by the 2010 CSEC math scores.

Conceptual Framework

In any organization, there are a series of interactions that occur. Schools as organizations are no different as there are a series of interactions occurring among the students, teachers, administrators, and the wider community. These interactions affect the individuals in a school as well as affect the total environment and the climate of the school. In an effort to understand school climate it is important that there is a look at the series of interactions that occur in a school.

Research on organizational climate reveals that there are many ways in which climate is defined and operationalized. Over the years two main frameworks of school climate emerged. Early works of Halpin and Croft (1963) laid the foundation for the open schools framework while the work of Hoy and his colleagues (Hoy & Clover, 1986; Hoy & Forsyth, 1986; Hoy & Miskel, 1991; Hoy, Tarter & Kottkamp, 1991) have contributed to the healthy schools framework. These two frameworks have been used to construct various school climate instruments used to measure school climate. Both frameworks focus on the interrelationships between individuals and the interactions that occur between and among individuals in a school.

Over the years, researchers have realized that many of the subscales that exist in both frameworks overlap and can be combined to form consolidated frameworks. The conceptual underpinning of this study lies in a consolidated school climate framework developed by Tschannen-Moran, Parish and Dipaola (2006). These researchers combined elements of the open schools framework and elements of the healthy schools framework

to develop a consolidated framework called the School Climate Index (SCI). This framework focuses on the same interactions portrayed in previous school climate frameworks: principal-teacher, teacher-teacher, teacher-student, and school-community.

This framework presented by Tschannen-Moran, Parish and Dipaola (2006) looks at the interactions in a school in terms of collegial leadership, teacher professionalism, academic press, and community engagement. These subscales provide the basis for this current study which focused on the relationship between school climate, as measured by this framework, and student achievement in a school. This framework, and in effect this study, can be very useful to educators because the interactions that occur in a school do affect the operation of a school.

As accountability on the part of schools continues to remain on the forefront of an educational system, educators continue to seek ways of improving their schools. This study provides a framework for use by educators to scrutinize their school's organizational climate and thus the series of interactions that occur in their organizations.

Procedures

A quantitative design was employed to find out if there were relationships between organizational school climate and student achievement in secondary schools in Belize. Forty-two schools were involved in this study, and data were collected from these schools concerning the faculty perspectives of their schools' climates. Permission was sought and granted from the Quality Assurance and Development Services, a unit in the Ministry of Education, Belize City, to obtain the student scores.

Principals of the secondary schools in Belize were contacted to gain permission to conduct surveys in their schools. Once permission was granted, the researcher distributed

the School Climate Index during a regularly scheduled faculty meeting time at each school or at a designated time given by the principal. Information gathered from this survey and the student achievement data were descriptively and statistically analyzed to determine relationships. For the analysis, however, only those schools that had ten or more teachers were used.

The computer program, Statistical Package for the Social Sciences, version 17.0 was used to analyze data. Mean scores, standard deviations, and range were calculated for the factors involved in the study: collegial leadership, teacher professionalism, academic press, community engagement, and CSEC Math scores. Pearson-product-moment correlations were computed to determine whether a statistically significant relationship existed between overall school climate as perceived by teachers in Belizean secondary schools and student achievement on Math CSEC exams. Multiple regression analysis was accomplished to determine the relative weight of each of the different school climate factors on academic achievement.

Significance of the Study

The increased emphasis on quality education and student achievement is causing many schools to engage in introspection to determine how best to improve student performance. School improvement initiatives break the cycle of being at a disadvantage and try to close the achievement gap in schools. This study highlighted one aspect educators can examine in their schools if their aim is school improvement.

In the era of accountability, schools need to continue producing results on national and regional exams. Knowing what causes students to improve can be very crucial to school improvement. This study provides important information to Belizean

educators as it gives them an additional avenue to consider when looking at factors that can possibly influence student achievement. This information becomes very helpful in the planning process particularly in school improvement plans. Because this study uses an instrument that focuses on four different aspects of the school, educators can consider each of these aspects when developing their school improvement plans. Knowing the relationship between school climate and academic achievement can also become very useful to educators in preparation of teachers who play a vital role in the life of a school.

Assumptions

This study on the effects of organizational climate on student achievement in Belizean secondary schools was guided by the following assumptions:

1. The data collected on organizational climate of the schools reflected the perceptions of teachers at the particular time when the data were gathered.
2. The data provided by the teachers were honest opinions because anonymity was an integral part of the data collection process. No further verification of the information gathered from the teachers was attempted so their contribution was considered as the reality at their schools.
3. A majority of the students enrolled in secondary schools in 2009-2010 sat for the Math CSEC exam in June, 2010.

Operational Definitions

The terms used in this study and their definitions follow:

Organizational climate- "the set of internal characteristics that distinguishes one school from another and influences the behavior of its members" (Hoy & Hoy, 2009, p. 329).

Collegial leadership- "principal behaviors perceived as supportive and collegial and not overly directive or restrictive" (Uline & Tschannen-Moran, 2008, p. 61). Behaviors of such a principal include being friendly, approachable, willing to make changes, sets clear expectations for faculty, and treats all faculty members as his or her equal.

Teacher professionalism- "behaviors that show that teachers are committed to their work and are willing to work cooperatively with one another" (Tschannen-Moran, Parish & Dipaola, 2006, p. 397). Such behaviors include respecting the professional competence of their colleagues, accomplishing their jobs with enthusiasm, providing strong social support for their colleagues, and displaying a high level of commitment to helping students.

Academic press- "A school-wide tone that is serious, orderly, and focused on academics. Schools with a high level of academic press are driven by a quest for excellence" (Tschannen-Moran, Parish, & Dipaola, 2006, p. 397). In such an environment, the school sets high standards for academic performance and students respect each other who get good grades; academic achievement is recognized and acknowledged by the school, and students seek extra work so that they can get good grades.

Community engagement- "This construct describes the degree to which the school can count on involvement and support from parents and community members, and the extent to which the school provides the community with information about its accomplishments" (Uline & Tschannen-Moran, 2008, p. 61).

Caribbean Secondary Education Certificate exam (CSEC): Criterion-referenced exams given at the technical or general proficiency levels to students of Caribbean secondary schools. These exams provide students with the foundation for further studies and entry to the workplace (Caribbean Examinations Council, 2011).

Summary and Organization

The quest for academic excellence is no doubt a huge factor for educators and particularly those in administrative positions in the schools. There are many factors that affect students' academic achievement and of late there has been a growing body of literature in support of school climate being one of those crucial issues.

The educational system in Belize, like many in other parts of the world, consistently seeks ways of improvement in an effort to meet the needs of a diverse and growing student population. A look at the possible relationship between school climate and student achievement in this setting gives valuable information to the Belizean educators who consistently seek methods of improvement for their schools and by extension the Belizean educational system. As educational researchers continue to conduct studies and reveal new findings on factors that affect student achievement, educational institutions will continue to respond by making attempts at providing quality education for all the students of their nation.

This study is organized into five chapters, with the first chapter providing an overview of the study, delineating factors associated with academic achievement, and addressing the significance of the study, its limitations, and its assumptions. Chapter Two explores the research literature on school climate and the effects of school climate on academic achievement. Chapter Three describes the methodology, research design, and

the techniques of data collection and analysis. The results of the study are presented in Chapter Four, and Chapter Five is a discussion of the findings related to the research questions and hypotheses. This final chapter will also address the practical implications of the findings as well as outline recommendations for further study.

CHAPTER TWO

REVIEW OF LITERATURE

The focus of this literature review is determined by this study's overarching research question: Does organizational school climate affect academic achievement in Belizean secondary schools? This chapter provides background information on the context of the study and presents factors that affect student achievement. School climate as a factor affecting achievement is elaborated on, frameworks of this factor are given, and school climate research findings are presented.

Contextual Background

School improvement and change are nothing new to educational systems worldwide. School leaders and educational administrators are constantly seeking ways to improve their schools and their students' academic success. This complex construct is based on the interactions of many variables which are themselves complicated constructs. Some of these variables are students' ability levels, developmental needs, class size, prior achievement, motivation, home support, and teaching methods (Kampwirth, 2003).

The Belizean educational system is no exception to those seeking ways of improving learning in the classroom for the success of the students and, thus, of the nation. Because the context of this study is in a Belizean setting, a brief description of the Belizean educational system is given in the next few paragraphs. Particular attention is

given to secondary schools since the teachers from these schools comprised the population for this study.

A snapshot of the Belizean educational system reveals that for the 2009-2010 school year there were 193 preschools, 297 primary schools, 52 secondary schools, 11 junior colleges, and three tertiary-level institutions. Of these 556 schools, 105 (19%) were fully funded by the government, 367 (66%) were government- aided and the remaining 84 (15%) were private or specially- assisted schools. These 556 schools served a total student population of 99,034. The total teaching force for 2009-2010 was recorded as 4,907 with twice as many females as males (Education Statistical Digest of Belize, 2011).

Secondary schools serve a unique portion of the Belizean population as they cater to the education of the adolescents in the country. Secondary education, meant for students between the ages of 12-18 and consisting of four forms, provides a broad academic foundation, and upon completion of the four years of this level of education, students have the option of joining the labor force or continuing their studies in higher education. The 52 secondary schools are located across the six districts of the country with the urban areas accounting for more than half (56%) of the secondary schools. Belize District has the most secondary schools with 13 of its 19 schools located in an urban setting. That district and the Cayo District account for most of the secondary schools in the country, while the southern districts (Stann Creek and Toledo) account for the least. The secondary schools are government schools, government-aided denominational schools, government-aided community schools, private schools, and specially-assisted schools. Government schools are fully funded by the government while

all other schools, except for private schools, receive some financial assistance from the government. The plurality of the secondary schools in Belize (40%) is made up of government-aided denominational schools.

The total secondary school enrollment was at 18,422 for the 2009-2010 school year, with 9,676 females and 8,746 males. The Belize District showed the highest enrollment (33%) followed by the Cayo District (24%). The completion rate for 2009-2010 was at 62.5% with a slightly higher completion rate for females than for males (66% to 59%). With regard to the teaching force in secondary schools, the total number of teachers for 2009-2010 was 1,301with female teachers outnumbering male teachers; 704 females to 597 males (Education Statistical Digest of Belize, 2009-2010). Appendix A depicts the number of secondary schools teachers in the country of Belize by district, gender and management for the 2009-2010 school year.

As described above, the educational system of Belize, and secondary schools in particular, are assigned the arduous task of educating those who are soon to be the important decision-makers for the country. This task comes with many challenges; thus, Belizean educators continue to seek ways of meeting the demands of the ever-changing student, and the needs of an ever-demanding society. Schools in Belize, like those around the world, are judged, criticized, and "graded" according to their performance on standardized tests (Au & Valencia, 2010; Foote, 2007). At least for now Belizean schools will continue to look for ways of continuous improvement on exams and continuous ways of improving student achievement considering that this is one of the indicators used to determine success of schools.

Factors Affecting Student Achievement

Student achievement is often an area of great concern to stakeholders in education because it is the hallmark of what the educational system is all about. A brief look at the educational literature quickly unveils the many factors that affect student academic achievement including personal, social, and contextual factors.

Scholars have long been interested in factors that affect student achievement. There is general acceptance that disparity in achievement is not necessarily due only to differences in cognitive abilities, but also to a number of personal and school factors. One perspective held by scholars is that differences in academic achievement are largely due to home and personal characteristics (Barnard, 2004; Barton, 2004; Evans, Shaw & Bell, 2000; Klinger, 2000; Lee & Kushner, 2008; Okpala, Okpala & Smith, 2001; Ruiz, 2009).

In contrast to the perspective that family and personal factors affect academic achievement, a growing body of literature reveals many school factors that influence achievement. Proponents of this view believe that factors such as teacher-student engagement (Bryson & Hand, 2007; Cawelti, 2000), principal leadership style (Blase & Blase, 2000; Goleman, 2006; Hallinger, 2003; Hoy & Hoy, 2009), method of instruction (Miller & Calfee, 2004; Rumberger & Thomas, 2000), faculty trust in students and parents (Goddard, Tschannen-Moran & Hoy, 2001), collective efficacy (Goddard, Hoy, & Woolfolk, 2000), and academic emphasis of schools (Goddard, Sweetland, & Hoy, 2000) with the latter three being collective properties of a fairly new concept called academic optimism (Smith & Hoy, 2007; Hoy & Hoy, 2009), all have significant impact on student achievement. These factors affect students in various ways; thus school leaders show continuous interest in these factors and their effects on student achievement.

A comprehensive and detailed review of the research on school factors that affect student achievement exceeds the scope of this paper; however, focus will be directed to the construct of school climate which, recently, has been gathering quite a bit of attention in the scholarly field as it is one of those school factors that does seem to affect student achievement.

Definition of School Climate

School climate research is fast becoming an area of practical significance to educators but a look at the school climate literature quickly reveals that there is no consensus over a single definition for the term, and its multifaceted nature has allowed for various interpretations. Sweetland and Hoy (2000) aptly denote, "the concept of school climate itself is defined in myriad ways and is often merely a slogan rather than a carefully defined and meaningful construct" (p. 704). School climate thus has become an intriguing topic for researchers as they have attempted to define this construct. Though there may not be a single definition of the term, there is consensus on similar attributes that encompass school climate. Early work on school climate by Halpin and Croft (1963) likened climate to personality and suggested that just as people have personalities, so do schools. Sargent (1967) concurred as he described climate as the personality sketch of a school which can be used to describe a school much the same way as personality can be used to describe a person.

Two decades later, scholars added various perspectives to the definition. Brookover, et al. (1982) believed that the nature of human relations among adult members of the organization constitutes climate. Sweeney (1988) described climate as how people feel about their school and also suggests that it is a combination of values,

beliefs, and attitudes shared by all those who have a role to play in the school. More recent definitions include school climate being seen as the set of internal characteristics that distinguish one school from another (Hoy & Miskel, 1996), a concept used to capture the basic and enduring quality of organizational life (Sweetland & Hoy, 2000), the heart and soul of a school (Freiberg & Stein, 2003). Lunenburg and Ornstein (2004) suggested that organizational climate can be expressed by adjectives such as open, bustling, warm, easygoing, informal, cold, impersonal, hostile, rigid, and closed. Koth, Bradshaw, and Leaf (2008) add a social perspective to the definition as they believed that it involves social interactions among students and teachers. Uline and Tschannen-Moran (2008) concur as they purport that school climate is an assessment of the social dynamics in a school. Mitchell, Bradshaw, and Leaf (2010), however, supported the definition given by Sweeney and stated that "school climate is defined as the shared beliefs, values, and attitudes that shape interactions between the students, teachers, and administrators" (p. 272).

From these myriad definitions one can detect that school climate has something to do with the school as the organization, it influences and is influenced by those who constitute the school as an organization, and it is a quality that identifies who you are as a school. Just as there is no consensus on a single definition of school climate, there is no consensus on a single framework of school climate. Scholars have developed several frameworks for school climate and so like its definition, this aspect of school climate is still evolving.

School Climate Frameworks

Like the definition of school climate, school climate frameworks exist in many different forms. A variety of school climate frameworks has been developed for use as guides for measuring the climate of schools. The early work of Halpin and Croft (1963) in conceptualizing school climate laid the foundation for many of the frameworks that came after. This duo developed a school climate framework that involved eight dimensions of teacher-teacher and teacher-principal behavior. They named the instrument the Organizational Climate Description Questionnaire (OCDQ) and it was developed only to measure the climate of elementary schools. Chance and Chance (2002) described this instrument as "one of the pioneering and best known instruments to describe school climate" (p. 67).

Presently, school climate instruments are changing form rapidly as researchers try to find the best ways of measuring this multifaceted construct. School climate literature reveals that two major perspectives exist and these are openness and health. The framework of open school climate comes directly from the work of Halpin and Croft (1963). The original OCDQ was revised to be used in schools not only at the elementary level but also at the middle and high school levels. Regardless of the revisions made to this instrument, the concept remained the same: there is a measure of school climate on a continuum from open to closed (Hoy & Hoy, 2009). Hoy, Hannum, and Tschannen-Moran (1998) shed some light on the factors that characterize open and closed climates. An open climate is considered to be one in which there is a high degree of authenticity in regard to both principal and teachers. The principal leads by example, and teachers work well together, as they are committed to their school. A closed climate, on the other hand, is characterized by principals and teachers who simply go through the motion with an

emphasis on busywork that is not of much benefit to the institution. The principal is not a very effective leader and closely monitors the teachers who are often not very satisfied.

Another well-known framework for school climate is that of healthy schools. The work of Hoy and his colleagues contributed much to the notion of healthy school climate (Hoy & Clover, 1986; Hoy & Forsyth, 1986; Hoy & Miskel, 1991; Hoy, Tarter & Kottkamp, 1991). Healthy organizations are those that are able to "manage successfully with disruptive outside forces while effectively directing their energies toward the mission and objectives of the organization" (Hoy & Hannum, 1997, p. 292). A major characteristic of this framework is that it considers three levels that are said to exist in every organization: the managerial, the technical, and the institutional level. A healthy school climate exhibits positive student, teacher, and administrator interrelationships. Teachers and students believe in themselves and set high goals for themselves, principals go the extra mile to assist teachers, and the school has a good relationship with the community in which it exists (Hoy, Smith & Sweetland, 2002).

The Organizational Health Inventory (OHI), developed to measure the health of schools, measures factors at the three levels: at the technical level academic emphasis and teacher affiliation; at the managerial level collegial leadership, resource supportiveness, and principal influence; and at the institutional level, institutional integrity (Hoy & Hannum, 1997; Hoy & Hoy, 2009; Hoy & Tarter, 1997; Hoy, Tarter and Kottkamp, 1991).

Openness and health are two important metaphors used in describing school climate, and instruments have been developed for each of these frameworks. As researchers conduct more studies on school climate they have found that the use of the

instruments to measure openness and health can sometimes become cumbersome. In an effort to provide practitioners with a flexible instrument that could readily be employed, some scholars decided to combine the two frameworks and developed a consolidated framework for school climate (Hoy, Hannum & Tschannen-Moran, 1998; Hoy, Smith, & Sweetland, 2002; Tschannen-Moran, Parish & Dipaola, 2006).

Consolidated Frameworks

In both of the revised versions of the openness and the health frameworks, a total of 12 factors was included with the openness framework having anywhere from 34 to 64 items and the health framework having 44 items (Hoy, Smith & Sweetland, 2002). Researchers realized that there was some overlap in the metaphors of openness and health. Some of the factors could be combined and some could be eliminated to create a more concise measure of school climate that would still encompass the two perspectives of openness and health. Comparisons reveal that both openness and health frameworks have been proven to be useful in analyzing the climate of schools, both frameworks measure aspects related to the workplace, and both use apt metaphors to examine the climate of schools (Hoy, Smith, & Sweetland, 2002). Hoy, Hannum and Tschannen-Moran (1998) adds that "moreover, open schools tend to be healthy ones and healthy schools tend to be open" (p. 341).

The works of Hoy and Sabo (1998) and Hoy, Hannum, and Tschannen-Moran (1998) contributed greatly to the development of a "parsimonious framework." Using the dimensions from both of the perspectives, they performed second-order principal components analysis to simplify the frameworks. The factors, supportive principal behavior, directive principal behavior, restrictive principal behavior, collegial teacher

behavior, committed teacher behavior, disengaged teacher behavior from the openness metaphor, and institutional integrity, collegial leadership, principal influence, resource support, academic emphasis, teacher affiliation from the health metaphor were reduced to four factors that accounted for 71% of the variance (Hoy, Hannum & Tschannen-Moran, 1998).

The first factor which described the relationship between the principal and teachers encompasses the original factors of supportive and collegial leadership, directive and restrictive principal behavior. The first two aspects loaded positively and the latter two loaded negatively. This factor was thus given the name collegial leadership which describes behavior of the principal as being supportive while not being directive or restrictive. Relationships that the teachers had with each other characterized the second factor and included teacher commitment, teacher collegiality, teacher affiliation, and teacher disengagement. Of these factors, the first three loaded positively and the last one loaded negatively. This factor was given the name teacher professionalism and deals with behaviors of the teacher characterized by respect, warmth and friendliness, and commitment to students. The third factor included academic emphasis, resource support, and principal influence which was labeled as academic press as all items loaded positively for this factor. Academic press involves teachers, students, and principals setting high but reasonable goals for the student, students responding positively to these goals, and the principal supplying necessary resources and assist in any way to attain these goals. One item, institutional integrity defined the last factor. This deals with teachers being protected from unreasonable community demands. Hoy, Hannum and

Tschannen-Moran (1998) decided to change this factor to environmental press to encompass external (environmental) as well as internal (academic) press.

This parsimonious framework with a total of 95 items is said to be more feasible because it captures the essence of both the open metaphor and the health metaphor. Grouping the factors makes for the development of more useful instruments. Moreover, for the health metaphor, the technical, managerial, and institutional levels inherent to organizations are considered. Collegial leadership encompasses the managerial level, teacher professionalism and academic press the technical level, and environmental press the institutional level. Sweetland and Hoy (2000) added that this simplified view calls attention to four important linkages in schools: principal-teacher (collegial leadership), teacher-teacher (teacher professionalism), teacher-student (academic press) and the school and the community (environmental press). Hoy, Smith and Sweetland (2002) refer to these linkages as vertical and horizontal linkages. Vertical linkages are between the school and community (environmental press), between the teachers and principal (collegial leadership) and between the teacher and students (academic press) while the horizontal linkages are among the teachers as colleagues (teacher professionalism). This new parsimonious framework seems to be effective and Hoy, Hannum, and Tschannen-Moran (1998) has gone as far as saying that "once the four factors are considered, other factors are redundant and add nothing to the explanation of variance in student achievement" (p. 342). Hoy, Hannum, and Tschannen-Moran had expressed concerns about the term environmental press as it does not differentiate positive forces from negative ones and outside forces did not always mean negative forces. It was left up to other researchers to continue to refine this aspect of the new framework.

It must be noted that this earlier work on a parsimonious view was limited to middle schools. Hoy, Smith, and Sweetland (2002) extended this work to high schools and agreed upon the same aspects of the new framework. They assessed the four aspects developed in the original parsimonious framework and developed an Organizational Climate Index (OCI) that was specifically for high schools. Their goal was to refine the framework further and reduce the number of items even further still keeping the four suggested dimensions. Their statistical analyses resulted in a 27-item scale and a renaming of the terms academic press and environmental press. Academic press was renamed achievement press as it reflects the press from parents and community on the academics of the school. Earlier research had focused on academic press as solely internal pressures. Environmental press was changed to institutional vulnerability as the authors felt that it reflects the more negative tone of the set of items in that category. The authors conceded that the only thing missing from this newly emerged consolidated framework was the positive side of school-community relations.

Building up on this gap in the research, Tschannen-Moran, Parish, and Dipaola (2006) suggested the most recent revision to the school climate framework and developed the School Climate Index (SCI). These authors concurred with previous scholars on the factors of collegial leadership, teacher professionalism and academic press. The fourth factor, environmental press or institutional vulnerability, as it was previously called, was addressed in a slightly different manner. Dipaola and Tschannen-Moran (2005) conducted a study on how best to deal with outside influences as an organization and found that bridging strategies were much more beneficial to schools than buffering strategies. Bridging strategies basically meant embracing the community so that school

and community could work cooperatively while buffering strategies meant keeping the schools independent from their environments.

The authors developed an instrument to measure bridging strategies known as a community engagement measure and likewise associated buffering strategies with institutional integrity. Tschannen-Moran, Parish, and Dipaola (2006) used this same concept of bridging and buffering in the development of the SCI to deal with the institutional integrity/environmental press aspect of it. They employed the community engagement instrument that was developed for the bridging or buffering study and changed the term environmental press to community engagement. They described community engagement as "the extent to which the school fosters a constructive relationship with the community" (p. 398). Table 1 was constructed by the researcher of this current study to outline the development of the various school climate frameworks based on the literature.

Table 1

Development of Frameworks for School Climate

Consolidated framework	Contributors	Factors included	Changes	Result
Parsimonious View	Hoy, Hannum & Tschannen-Moran (1998) Hoy & Sabo (1998) Sweetland & Hoy (2000)	Academic press Collegial leadership Teacher professionalism Environmental press	Institutional integrity to environmental press	95-item instrument
Organizational Climate Index (OCI)	Hoy, Smith & Sweetland (2002)	Achievement press Collegial leadership Teacher professionalism Institutional vulnerability	Academic press to achievement press Environmental press to institutional vulnerability	27-item instrument
School Climate Index (SCI)	Tschannen-Moran, Parish, & Dipaola (2006)	Academic press Collegial leadership Teacher professionalism Community engagement	Institutional vulnerability to community engagement	28-item instrument

The description of school climate (Table 1) points to a multifaceted construct that continues to evolve, take shape and form as researchers search for ways of defining and describing school climate. Zullig, et al. (2010) pointed out that one of the challenges in addressing school climate is in relation to what is measured and how it is measured. The lack of consensus on a single definition of school climate as well as the lack of consensus on definite factors that encompass school climate, has not deterred researchers from

carrying out studies on this construct. Researchers have been able to describe characteristics of school climate carefully as it relates to their studies and have thus carried out very useful studies.

School Climate Studies

As will be evident in this brief review of literature on school climate studies, various methodologies and sampling groups have been used in school climate studies. Likewise, various factors such as achievement, delinquency, faculty trust, and teacher empowerment have been studied to determine their effects on school climate and vice versa. This section presents literature on school climate studies as well as a portrayal of studies that have been done at the elementary, middle, and high school levels, using various frameworks such as those described earlier.

School climate studies in elementary schools reveal the use of the OHI. Goddard, Sweetland, and Hoy (2000) chose the academic emphasis subscale of the OHI to investigate how school effectiveness could be enhanced by a school climate characterized by high levels of academic emphasis. This study was limited to urban elementary schools and revealed that academic emphasis is positively related to student achievement in mathematics and reading. An important aspect of this study is that it employed hierarchical linear modeling, a statistical procedure that allows for analysis of both individual student and school data without aggregating variables at the school level. This study revealed that academic emphasis in schools does promote student achievement and is an important facet of school climate that needs to be considered.

Following up on achievement and climate in elementary schools, Johnson and Stevens (2006) found a statistically significant positive relationship between school mean

teachers' perceptions of school climate and school mean student achievement. Their study further revealed that for those schools with high SES communities, the effect of climate was stronger on academic achievement than for those schools with low SES communities. This study, employing the School-Level Environmental Questionnaire to which the faculty of 59 elementary schools in a southwestern USA city responded, confirms the influential effect of school climate on student achievement and highlights SES as a mediating factor in this relationship.

Koth, Bradshaw, and Leaf (2008) also studied school climate at the elementary level, but they looked at a totally different aspect from academic achievement. They were interested in examining the extent to which the student's perceptions of school climate varied according to individual, classroom and school-level factors. This study was conducted in 37 Maryland public elementary schools. Individual and classroom level factors were found to be more closely associated with students' perceptions of school climate than school-level factors. Mitchell, Bradshaw, and Leaf, (2010) conducted a similar study on this same population and the results were surprisingly contrary to those found two years earlier. As a matter of fact, the complete reverse was found: students' perceptions were mostly affected by school factors rather than by classroom factors. This latter study also looked at teachers' perceptions and it was found that classroom-level factors were more associated with their perceptions.

Data for both of these studies were collected as part of a large-scale analysis of reform initiatives. The earlier study was conducted in the first year of the initiative, and thus may not have had any effect on this later analysis while the latter study was conducted two years into the reform initiative and that could probably explain contrasting

results. The sample for these studies was limited to fifth grade students so no further conclusions can be drawn from these particular examinations of elementary schools beyond this specified grade level. These studies do, however, provide useful information as they underscore the importance of looking at climate studies at different levels and from different perspectives.

A look at the literature on middle school climate reveals that quite a number of studies have been directed at this level, only a few of which are presented here. The OHI was employed by Hoy and Hannum (1997) to research the climate in 86 middle schools in New Jersey. They found that general school health was positively associated with student achievement in math, reading, and in writing. Academic emphasis and SES were found to be the two strongest predictors for achievement in math. Hoy, Hannum, and Tschannen-Moran (1998) studied this same population. Instead of using the OHI, however, they used the parsimonious version of the instrument which, as previously described, is a combination of elements of the OCDQ and the OHI. Even with this new instrument they found similar results to the previous study: school climate and student achievement were positively related. They found too that SES and academic press had significant and independent effects on Math achievement as well as environmental press, a new construct of the parsimonious framework. These authors also purported that school climate is relatively enduring as the results were similar to those of a similar study conducted two years earlier (Hoy & Sabo, 1998).

Taking the middle school climate studies from a different perspective, Sweetland and Hoy (2000) looked at the relationship between school climate and teacher empowerment as well as the relationship between teacher empowerment and school

effectiveness. This was done at 86 New Jersey middle schools with 2,741 teachers. Using the parsimonious framework, they found that three aspects of school climate (academic press, collegial leadership, and teacher professionalism) were directly related to teacher empowerment with academic press and collegial leadership being the strongest predictors. Environmental press was not significantly related to teacher empowerment. These authors conclude that certain kinds of climate do facilitate the empowerment of teachers which, in turn can, affect school effectiveness and student performance.

To test the new conceptualization of the School Climate Index (SCI), another of the newly consolidated frameworks, 82 Virginia middle schools were studied. Tschannen-Moran, Parish, and Dipaola (2006) found moderately strong, and positive relationships between middle school climate and student achievement in English, Math, and Writing. This study also considered the effect of SES, and found that while SES had an independent effect on student achievement, school climate was found to affect student achievement independently in all three areas of English, Math, and Writing. Regardless of SES, schools with a more positive climate tended to have higher student achievement. Of significance here is that community engagement, a new concept of school climate, and academic press had independent effects in explaining student achievement in English. There is again confirmation of the effect of school climate on student achievement as is presented in earlier studies.

Another unique perspective of school climate was revealed in a study at 80 Virginia middle schools in which investigations were done to determine the interplay of quality facilities, school climate and student achievement (Uline & Tschannen-Moran 2008). The results indicated that school climate plays a mediating role in the relationship

between the quality of facilities and student achievement. This has implications for schools in that when considering the building facilities one must also consider the social interactions that occur; and so design features should reinforce and enhance the social aspect. The interactions that occur among students and between students and teachers are very important in enhancing learning, and the building design sometimes affects this. This study takes a very unique perspective as it starts to shed light on how the school's physical structure reinforces the teaching and learning goals. Similar studies in elementary or high schools would be of significance to school climate literature.

Finally, the literature reveals that a few school climate studies have also been conducted at the high school level. Plucker (1998) looked at the relationship between school climate and student aspirations. Conducting studies in New England high schools, the researcher surveyed 1,170 students using the Secondary School Aspiration Survey and found that students reporting high aspirations perceived a more supportive school climate than students with low aspirations. For this study, aspiration was looked at in terms of inspiration and ambition. Plucker reported that students who felt they were valuable members of the school community had higher inspiration scores than students who did not feel the same way. Overall, the students' perceptions of school climate were higher for those with higher aspiration scores and lower for those with low aspiration scores.

This study sheds light on an important aspect—the role of a belonging climate. Considering that high schools serve that group of students whose lives are surrounded by factors such as peer pressure and the need to belong, it is appropriate that such a study would reveal the importance of supportive climates for high school students. The author

suggests that further research needs to be done on this aspect of school climate taking into consideration demographics, and family characteristics. The sample used in this study was gender balanced but not racially diverse.

A study of high school climate using the OHI to investigate effects on student achievement reveals similar results to studies done in middle schools. Smith (2002) looked at high school climate from the perspective of organizational health and its effect on student proficiency in Mathematics. This study was conducted in 97 high schools in Ohio and the OHI was used to collect data from faculty. Organizational health does affect student achievement in Math with academic emphasis having the strongest relationship. Further analysis by multiple regression revealed that 33% of the variance in Math achievement could be attributed to SES and academic emphasis. This was also the case in middle schools.

A different perspective on high school climate is demonstrated in the work of Hoy, Smith, and Sweetland (2002). Using the population in the preceding study, Hoy, Smith, and Sweetland tested the assumption that there is a relationship between organizational climate and faculty trust. They did not use the OHI as the instrument to gather information about climate but rather the OCI which was developed from the combination of certain elements of the OCDQ and OHI. Faculty trust was measured using a Faculty Trust Survey. They believed that each aspect of faculty trust would have a different set of climate predictors. What they found was that faculty trust was related to all dimensions of climate with professional teacher behavior having the highest correlation. This study reminds leaders that the key to developing trust in colleagues is professional teacher behavior. This can be taken into consideration when trying to

analyze the climate of one's school. Heller (2004) reminds educators that building trust is a long-term operation involving teachers working together with administrators in a system that "values people trying new approaches and does not simply look for missteps to attack" (p.78). Building faculty trust could thus have a crucial influence on teachers and by extension the success of the students.

The studies briefly discussed here clearly demonstrate that school climate does have some effect on achievement as well as on other constructs such as student aspiration, teacher empowerment, and faculty trust. Also, it is seen that studies have been conducted in the elementary, middle, and high school levels. SES continues to show up as an enduring factor that affects achievement. As for school climate variables, academic emphasis seems to be the factor consistent with SES as having the most effect on achievement.

Researchers look at many aspects when they study school climate, and more and more researchers are moving away from looking at effects of school climate on academic achievement only to looking at its effects on other constructs. Studies are also being done on school climate as a social factor and as a psychosocial environment. Ruus, et al. (2007) looked at school climate from its social aspect and hypothesized that if one could modify a school's social climate, then one could either help or disable the development of a student's coping strategies and, by extension, support or not support the academic success of students. The most important finding here was that the school has some responsibility for students' optimism, their well-being, and their academic success. Positive school climate affects students' coping strategies and schools must consider achievement values as well as soft values.

Sprott (2004) investigated the role of classroom and school climate on the development of early delinquency of youths measured by violence and property offending. Interestingly, he found that an emotionally supportive classroom was related to lower levels of violence and focusing on academics in classrooms was associated with lower property offending. Classroom climate had a stronger influence than school climate but Sprott believes that the effect of the school climate is indirect. Classrooms are nested within schools and so the environment of classrooms is somewhat influenced by the climate of the school which is also influenced by the climate of the surrounding community in which the school exists.

An interesting perspective is taken on school climate in a recent review of the school climate research. Cohen, McCabe, Michelli, and Pickeral (2009) purport that there is a glaring gap between the research findings on school climate on the one hand, and the policy and practice that is instituted regarding school climate on the other hand. In other words, even though the school climate literature reveals that this construct has an effect on several aspects such as academic achievement, school success, effective violence prevention, and coping strategies, the educational policies implemented and the practices of schools are still not sufficiently emphasizing this construct which has been proven to have positive effects on schools. Harris (2005) reminds us that school improvement requires a focus on the total environment thus school climate research is a very useful avenue for practitioners who want to make positive changes in schools.

Caribbean Secondary Education Certificate Exams

Established in 1972, the Caribbean Examinations Council (CXC) is a regional examining body responsible for providing examinations and certification at the

secondary and post-secondary levels in the Caribbean. Three exams provided by this council are the Caribbean Advanced Proficiency Examination (CAPE), Caribbean Secondary Education Certificate Examination (CSEC), and more recently the Caribbean Certificate Secondary Level Competency Exam (CCSLC). The syllabus used for CXC examinations are developed in the Caribbean by educators who work in junior colleges and universities. A wide variety of subject areas in the academic, technical, and vocational fields are provided for candidates. The council's headquarters are located in Barbados and Jamaica and 16 participating territories are currently engaged, with Belize being one of the participating countries (Caribbean Examinations Council, 2011).

The exam that is taken by many Belizean students at the completion of their secondary school education is the CSEC exam. This is a criterion-referenced exam which utilizes a six-point grading scheme to determine the level of competence achieved by the student. Content validity of the exam is assessed using a table of specifications. The council offers a total of 33 subjects to secondary school students, 28 at the general proficiency level and 5 at the technical proficiency level. These proficiencies provide students with the foundation for further studies or for entering the workforce. Grades I-III at the general and technical levels is considered a pass and so tertiary-level institutions in Belize readily accept students for matriculation into their programs once they have attained such grades.

CSEC Mathematics was among the five subjects that the council offered in its first sitting in 1979 and since then many students have sat the Math CSEC exam in Belize and other participating countries. For Belize, the 2011 sitting saw a total of 2480 Math entries as this subject, along with English, continues to be one of the main subjects

that students in Belize sit at the end of their secondary education (Quality Assurance & Development Services, 2011).

Conclusion

Quite a number of factors affect academic achievement including personal and school factors. Recently, a growing body of literature indicates that not only personal characteristics of a student affect academic achievement, but school factors also have an effect. The factor known as school climate has been shown to have significant effects on achievement (Goddard, Sweetland & Hoy, 2000; Heck, 2000; Smith, 2002; Uline & Tschannen-Moran, 2008). Although there is no single definition of this construct, nor is there a single framework to represent this construct, it must be said that school climate research has come a long way and has made its mark in the educational arena as a concept worthy of attention by educational leaders. Thomas (2010) suggested that despite its American origin, school climate can be considered a universal phenomenon. The quest for consensus on school climate definition and facets of school climate will continue to intrigue scholars.

Regardless of all this, however, scholars have conceded that school climate affects achievement, so it is definitely merits the attention of school leaders and all those who have an interest in building successful schools. Charles (2002) reminded educators that providing a warm and supportive classroom climate lead to quality teaching and quality learning which is the role of the school in the first place.

CHAPTER 3

METHODOLOGY

The issue of academic achievement is prevalent among educators. The accountability drive has led many researchers and educators to look at a variety of ways that schools can improve academic success of their students. Organizational school climate is one of the constructs that has been found to have a positive correlation with academic success (Goddard, Sweetland & Hoy, 2000; Heck, 2000; Smith, 2002; Tschannen-Moran, Parish & Dipaola, 2006; Uline & Tschannen-Moran, 2008). As school leaders seek to develop an environment of learning at their schools, their focus must be on the factors that lead to academic success. How school climate, as measured by the School Climate Index (SCI), affects student achievement on the Caribbean Secondary Education Certificate Exams (CSEC) in Mathematics was the focus of this study in Belizean secondary schools. This chapter highlights the methodology used to answer the research questions posed by the study and delineates the participants involved, the instrument used, research design, procedures for data collection, data analysis, and ethical considerations.

Variables

Secondary school teachers' perception of their school's climate and its relationship to student achievement is this study's focus. Student academic achievement, the dependent variable, was measured using the 2010 results of the CSEC Mathematics exam, a standardized exam given to secondary school students in the Caribbean. The independent variable was the organizational climate perceptions of Belizean secondary

school teachers. Dimensions of such perceptions were collegial leadership, teacher professionalism, academic press, and community engagement.

Research Questions

Questions guiding the research were

1. What is the relationship between overall organizational school climate, as measured by the SCI, and overall student achievement on the CSEC Math exams in Belizean secondary schools?
2. What is the relative weight of each of the factors of school organizational climate— collegial leadership, teacher professionalism, academic press, and community engagement— in relation to student achievement on the CSEC Math exams?

Hypotheses Statements

The following null hypotheses were developed to guide the research:

H_{O1}: There is no significant relationship between overall teachers' perceptions of organizational climate, as measured by the SCI, and student achievement scores as measured by the 2010 CSEC Mathematics exam in Belizean Secondary schools.

H_{O2}: There are no significant independent effects of any of the school climate factors— collegial leadership, teacher professionalism, academic press, and community engagement— on student achievement as measured by the 2010 CSEC math scores.

Participants

Fifty-two Belizean secondary schools are scattered across the six districts in the country and are located in both urban and rural areas. Of these 52 schools 42 of them had students who sat the 2010 CSEC exams. The researcher invited all 42 schools to be part of the study and all 42 schools responded positively and thus became the sample for the study. Among these schools were government schools, government-aided community schools, government-aided denominational schools, and specially-assisted schools. Apart from being representative of both urban and rural areas, these schools represented diversity in racial and socio-economic background.

The participants for this study were the 1226 teachers who teach in these 42 secondary schools. Since these teachers were from various parts of the country, they represented diversity in culture, racial and socioeconomic status.

Instrument

Studies of organizational climate often employ survey research techniques, and focus on perceptions of members of an organization (Hoy, Hannum &Tschannen-Moran, 1998; Johnson & Stevens, 2006; Smith, 2002; Sweetland & Hoy, 2000). This study followed in such design and employed a survey to collect data. Survey research has become a popular method of collecting data for non-experimental designs (McMillan, 2004). More specifically, this study used what is known as a cross-sectional survey design. According to Gay, Mills, and Airasian (2006) this type of survey collects data from participants in a single time period and was appropriate since the aim was to learn the teachers' perceptions when the data were collected. The survey instrument was the

School Climate Index (SCI) developed by Tschannen-Moran, Parish and Dipaola (2006) (see Appendix B).

The SCI was developed as a conceptual framework for school climate built on the work of Halpin and Croft (1963) and Hoy, Tarter and Kottkamp (1991). Two frameworks for school climate that have gained much credibility are schools being open and schools being healthy. The Organizational Climate Descriptive Questionnaire (OCDQ), developed to measure the openness of schools, contained climate dimensions related to openness of schools for various levels: elementary, middle, and high school, each having various subscales (Hoy & Sabo, 1998; Hoy, Tarter & Kottkamp, 1991). This instrument measured the climate of schools on a continuum of open to closed climate and focused primarily on principal and teacher behavior. Hoy and Feldman (1987) developed the Organizational Health Inventory (OHI) to measure the health of schools, and this instrument also had various subscales, but took into consideration the different levels of the organization: technical, managerial, and institutional levels.

According to Tschannen-Moran, Parish, and Dipaola (2006), complexities have arisen with these instruments because of the array of dimensions as well as the various characteristics used to measure the different levels of the schools. For example, in the health survey, managerial level in high schools is assessed by principal influence, principal consideration, initiating structure, and resource support while at the middle school level it encompasses collegial leadership, principal influence, and resource support.

In light of this, the School Climate Index was developed as a consolidated climate framework to "assist scholars and practitioners in making sense of the confusing array of

subscales of the OHI and the OCDQ for the various levels of schooling" (Tschannen-Moran, Parish, & Dipaola, 2006, p. 396). The developers of the SCI employed second-order factor analysis to combine the subscales of the OHI and the OCDQ and found that from the 12 dimensions of the two frameworks there were four strong dimensions that emerged: collegial leadership, teacher professionalism, academic press, and environmental press. Furthermore, the dimension of environmental press was changed to community engagement as this was seen more as a positive aspect whereas the previous dimension focused on the negative aspects that the environment posed on the school. The researcher opted to use the SCI in this study because of its conciseness in measuring school climate.

The SCI was used as the primary instrument to gather information on the perceptions of the teachers in the sample of secondary schools and contains 28 Likert-type items with a 5-point scale in which the response choices include *never, rarely, sometimes, often, continuously*. Teachers were asked to describe the extent to which they agreed with statements such as:

"The principal is willing to make changes."

"Teachers are committed to helping students."

"Students seek extra work so they can get good grades."

"Our school makes an effort to inform the community about our goals and achievements."

The SCI measures the perceptions of teachers of their school's climate; therefore, it gives results of a collective and not an individual measure. High validity and reliability ratings have resulted from it being tested in 82 middle schools throughout the state of

Virginia (Tschannen-Moran, Parish & Dipaola, 2006). A principal factor analysis was conducted on the SCI to confirm construct validity. Reliabilities were found using Cronbach's alpha of internal consistency for overall SCI and for each of the subscales. The overall reliability was found to be .96 and the reliabilities for the subscales ranged from .92 to .94 with Collegial Leadership at .93, Teacher Professionalism at .94, Academic Press at .92, and Community Engagement at .93.

For the current study, sample reliability of the instrument was evaluated using the Cronbach's alpha coefficient of internal consistency. The Cronbach's alpha reliability coefficient was .932, indicating the instrument was reliable. According to McMillan (2004), reliability coefficients below .60 are generally considered weak or inadequate. Gay, Mills and Airasian (2006) point out that the minimum acceptable level of reliability differs among test types, but in general, the closer the reliability coefficient is to 1.0, the more reliable the test is.

Since analysis of data for this study involved categorizing the instrument items into subscales, reliability coefficients were also found for the subscales; these reliability coefficients ranged from .79 to .84 with Collegial Leadership at .91, Teacher Professionalism at .88, Academic Press at .79, and Community Engagement at .84. Gay, Mills and Airasian (2006) highlighted that reliability is a function of test length and so the subscales generally tend to have lower reliability coefficients than the total instrument.

Research Design

A non-experimental correlational design was selected because of its quantitative nature in examining whether a relationship exists between school climate and student

achievement. Correlational research can provide information that allows predictability based on associations. In the present study, there was an interest in the variables of school climate and student achievement. Thus, a correlational study was employed to determine if any relationship exists between the two. Correlational research allows for the analysis of multiple variables in one study, and it also indicates the degree of relationship among variables. This is, therefore, a very practical design for this study as various factors of school climate were looked at and the degree of relationship was an area of interest. It must be noted that correlational research does not provide for causality. McMillan (2004) stated that the most important principle in evaluating correlation research is not to infer causation. This simply means that in correlational research, one cannot conclude that variable X causes variable Y; rather, there is a relationship between the two variables. Pyrczak (2006) explained that the Pearson *r* statistic can be used to find out how much of the variance of one variable is accounted for by the other variable. The current study was to determine if a relationship exists between school climate and student achievement but not to investigate if one was caused by the other.

Multiple regression technique gave a more detailed analysis as it enabled the examination of the influence of each climate dimension on student achievement, controlling for all other climate variables. It also allowed the researcher to determine the combined effect of the variables (Gay, Mills, & Airasian, 2006). These authors also noted that multiple regression analysis is becoming increasingly popular "primarily because of its versatility and precision" (p. 369).

Certain assumptions must be tested and met in order for the results of multiple regression analysis to be useful. To ensure that the assumption of independence was met,

the researcher distributed the surveys personally and explained to the participants the importance of filling out their surveys independent of their peers. The researcher then collected the surveys immediately after each participant was finished. This method assisted in ensuring that the scores for any particular subject are independent of the scores of all other subjects.

Regression also assumes that variables have normal distributions and that the relation between the dependent and the independent variable is linear when all other independent variables are held constant. Observations of the visual representations of the histogram, scatterplot, and partial plots revealed that the assumptions of normality and linearity were met (See Appendix C).

A common problem that arises in multiple regression analysis is that of multicollinearity. This basically means that two or more of the independent variables being used are highly correlated with each other and in effect measure the same thing. This makes it difficult to identify the unique relation between each predictor variable and the dependent variable (Urdan, 2005). The collinearity statistics for this study revealed that none of the Variance Inflation Factors were above 10. In research this is said to be an acceptable number to test for multicollinearity as any number above 10 would be cause for concern ("How to identify multicollinearity," 2007).

The quantitative design chosen for the study allowed the researcher to determine if there was a relationship between school climate and student achievement and if so, to what extent the different dimensions of school climate had an effect on student academic achievement in Belizean secondary schools.

Procedure

Forty two secondary schools were contacted by the researcher to learn if they were desirous of participating in the study (see Appendix D). The teachers from these participating schools became the subjects. These teachers were given an informed consent form (see Appendix E), and the SCI survey instrument was administered to them by the researcher during a regularly scheduled faculty meeting. Guthrie and Scheurmann (2010) stated that the survey is an efficient manner for collecting information about a school's climate. The survey results revealed the teachers perceptions of their school's climate, the independent variable in the study. The Quality Assurance and Development Services (QUADS), a unit in the Ministry of Education, Belize City that is directly responsible for the administration of the CSEC exams in Belize was contacted to obtain the results of the 2010 CSEC math exams for the participating schools (see Appendix F). The 2010 math CSEC scores were used as the dependent variable.

Data Analysis

It is important to note that the focus of this study was on the aggregate—the collective faculty perceptions of school climate and not individual perceptions. Hoy and Sabo (1998) reminded researchers that the unit of analysis in school climate studies should be the school and not individuals because the variables being studied reflect organizational properties. In light of this, the school was considered the unit of analysis. Organizational climate is a description of the school and not of the individuals in the school. Likewise, academic achievement was calculated at the school level and not at the individual student level. For the variables of academic achievement and school climate,

analysis was conducted on school means. Of the 42 schools that participated in the study, four of these schools had fewer than ten teachers. These four schools were not factored into the data analysis for this study; thus, only data from the other 38 schools were used.

To score the SCI, the researcher followed the guidelines outlined by Tschannen-Moran (http://wmpeople.wm.edu/site/page/mxtsch) for scoring the school climate index for high schools:

Step 1: Calculate the average score for each item on the survey. This will be done by averaging all the responses to the survey for each item on the questionnaire. Two points will be assigned for every 'rarely' response, 3points for every 'sometimes' response, 4 points for every 'often ' response, and 5 points for every 'frequently' response.

Step 2: Calculate the mean score for each school on each of the four subscales:

Collegial Leadership –mean of items 7, 8, 16, 17, 23, 24, 25

Teacher Professionalism- mean of items 3, 4, 11, 12, 13, 18, 19, 20

Academic Press- mean of items 5, 6, 14, 15, 21, 22

Community engagement- mean of items 1, 2, 9, 10, 26, 27, 28

(http://wmpeople.wm.edu/site/page/mxtsch)

The statistical analysis was done using the Statistical Package for Social Sciences (SPSS) software version 17.0. Descriptive statistics were first calculated to ensure that there was variability in the data collected: mean, range, and standard deviation for all factors involved in the study: collegial leadership, teacher professionalism, academic press, community engagement, and CSEC Math scores. Pearson *r* correlation coefficient was then computed using the two sets of scores gathered from the schools: the SCI score

and the Math achievement score. Multiple regression analysis was then conducted to find out the independent effects of each subscale of school climate on student achievement. These analyses assisted the researcher in examining the intercorrelations of the four dimensions of school climate being utilized in this study, as well as the relationship of each to student Math achievement.

Ethical Safeguards

Approval was granted from Oklahoma State University Institutional Review Board for the Protection of Human Subjects in Research to conduct the study (Appendix G). Permission was sought from principals before any contact was made with the teachers. Principals were informed that their schools would not be identifiable in the published results of the study. Each participant received an informed consent form before they filled out the surveys, and the researcher also explained how anonymity would be maintained throughout the study. No names were asked for at any point in this study and the researcher collected the surveys immediately after they were completed and filed them in a coded folder. Principals were afforded the opportunity to receive the results of their schools' climate survey, and those who chose this option were not able to identify individual teachers' responses. Likewise the results will be published collectively so there will be anonymity for all schools and teachers involved.

CHAPTER 4

FINDINGS and ANALYSIS

This chapter presents the findings of this study. The purpose of the study was to investigate the relationship between school climate and student achievement in Belizean schools, and to explore predictive power of each factor of school climate—collegial leadership, teacher professionalism, academic press, and community engagement—on student achievement. This study was guided by the following research questions:

1. What is the relationship between overall secondary school organizational climate, as measured by the SCI, and student achievement on the Caribbean Secondary Education Certificate (CSEC) Math exams in Belizean secondary schools?
2. What is the relative weight of each of the factors of school organizational climate— collegial leadership, teacher professionalism, academic press, and community engagement— in relation to student achievement on the CSEC Math exams?

The independent variable, school climate, was measured using the SCI. Permission was sought from principals to administer the SCI, and the researcher administered it during regularly scheduled faculty meetings during the months of February, March and April. In four instances there was a time conflict with regard to faculty meetings; however, the principals readily accommodated the researcher by asking the staff to meet in one area after school or during a break so that the researcher could administer the surveys.

The dependent variable, academic achievement was measured using the 2010 Math Caribbean Secondary Examinations Certificate Exam (CSEC) results. Math CSEC scores were used as a proxy for student achievement. These scores were obtained from the Quality Assurance and Development Services, Ministry of Education, Belize City.

A description of the sample used in this study is presented in this chapter, and the research questions are answered by utilizing the statistical analyses performed in the study. Tables and a scatterplot are used to visually present the findings of this study.

Description of the Sample

Previous research indicated that the concept of school climate is best investigated at the school level rather than at the individual level because school climate variables reflect organizational properties (Hoy & Sabo, 1998). This study followed this trend in aggregating individual teacher scores to form school means that were then used in the analyses. Brief descriptions of the participating schools and the sample of participating teachers are given.

Schools Involved in the Study

Of the 52 secondary schools in the country of Belize, 42 had students who sat the 2010 CSEC Math exams. All 42 schools were invited to participate in the study, and all agreed to do so. The total population of teachers in these schools is 1,226. The response rate for this study was 81%; 987 teachers from the 42 schools completed the SCI. For the data analysis, however, only those schools that had 10 or more teachers were used. Four of the 42 schools had fewer than 10 teachers, so these were excluded from the analysis. The data analysis thus reflects a total of 962 participants from 38 schools.

The participating schools are representative of all six districts in the country of Belize with the largest number of schools (16) from the Belize District. Table 2 shows the number of participating secondary schools in each district. With regard to location, 74% (28) of the schools are in the urban areas, and 26% (10) are in rural areas. The 2010 population census revealed that the Belize district makes up the largest percent of the population (29%) while the Stann Creek and Toledo District make up the smallest percentages (10% each). With regard to urban/rural population, however, 45% of Belizeans reside in urban areas whereas 55% of the Belizean population resides in rural areas (Statistical Institute of Belize, 2011).

Table 2

Number of Secondary Schools by District

District	N
Belize	16
Cayo	8
Corozal	4
Orange Walk	5
Stann Creek	3
Toledo	2
Total	38

Participants Involved in the Study

The teachers in the 38 schools represented diversity in ethnicity, age, teaching experience, and level of education. Not all 962 participants responded to all demographic items; the number of responses for the demographic items ranged from 950 to 961.

Regarding ethnic and cultural representation, Mestizos comprised nearly half of the participants (42.2%) while the smallest representation is Asians (8%). Table 3 shows the frequencies and percentages of the different cultural and ethnic groups represented in the sample of teachers.

Table 3

Ethnicity/Cultural Background of Participants

Ethnicity/Culture	Frequency	Percent
Asian	8	.8
Caucasian	11	1.1
Creole	243	25.3
East Indian	37	3.9
Garifuna	99	10.3
Maya	31	3.2
Mestizo	406	42.3
Mixed Ethnicity	107	11.2
Other	18	1.9
Total	960	100.0

It is important to note here that the ethnic representation of the sample of teachers reflects the ethnic representation of the nation of Belize. The largest ethnic group in

Belize is the Mestizo group (50%) followed by the Creole (21%) (Statistical Institute of Belize, 2011).

The data regarding age group indicated that the largest percentage (25.4%) of teachers is in the 26-30 years age range. The least common age range is 20 years and below (.9 %). Table 4 displays the age range of the participants. These numbers indicate an overall teaching force of 78.4 % age 40 or below among the 38 participating schools. This is in line with Belize's population age structure; the median age in Belize is 22 years.

Table 4

Age Range of Participants

Age Range	Frequency	Percent
20 and below	9	.9
21-25	155	16.3
26-30	242	25.4
31-35	190	20.0
36-40	150	15.8
41-45	88	9.3
46-50	54	5.7
Above 50	63	6.6
Total	951	100.0

Gender distribution of the participants showed that there were 544 (57.3%) females and 406 (42.7%) males (*N*=950). Although there are more female educators than

male educators for the sample in this study, the 2010 population census in Belize revealed that there is an almost equal gender distribution in Belize: 51% males and 49% females (Statistical Institute of Belize, 2011).

Teaching experience of the teachers in the sample ranged from fewer than five years to more than 26 years. In this sample more than half of the participants (61.7%) had fewer than 10 years of teaching experience. These numbers correspond to the age ranges reported as more than half of the sample (78.4%) was below age 40. Only 7.4% of the sample of teachers reported having 26 years or more teaching experience. For this study, no further analysis was conducted on the effects of age and experience on teachers' perceptions of school climate. Table 5 represents the years of experience of the teachers.

Table 5

Teaching Experience of Participants

Teaching Experience	Frequency	Valid Percent (%)
5 years or less	339	35.4
6-10years	252	26.3
11-15 years	125	13.1
16-20 years	102	10.7
21-25 years	68	7.1
26 years or more	71	7.4
Total	957	100.0

Teachers in the study with bachelor's and associate's degrees made up the majority (49.9% and 32.8% respectively); those with a master's degree made up only 10.7%. Table 6 depicts the level of education of the participants. Although the minimum

qualification to teach at a Belizean secondary school is an associate's degree, 19 teachers (2%) of this sample group had below this minimum qualification.

Table 6

Level of Education of Participants

Highest Level of Education	Frequency	Percent
Primary School Certificate	2	0.2
High School Diploma	17	1.8
Level One Certificate	4	0.4
Level Two Certificate	18	1.9
Associate's Degree	316	32.9
Bachelor's Degree	480	49.9
Master's Degree	103	10.7
Other	21	2.2
Total	961	100.0

Summary of Demographic Information

The first part of the SCI was aimed at collecting demographic information from the participants. In summary, the demographic data collected in this study reveal that at the school level (*N*=38), the plurality of the schools (42%) are in Belize District; also, the majority of schools (74%) are in the urban areas. With regard to the participants within the 38 schools, there are more females than males, (57.3 % to 42.7%); more than half of the sample of teachers (78.4%) are under age 40; and the largest ethnic group (42.3%) is

Mestizo. Finally, more than half of the sample of teachers (61.7%) has less than 10 years teaching experience, and almost half of the sample (49.9%) has attained a bachelor's degree. The highest percentage (30%) of teachers in the sample who attained a bachelor's degree fall in the 26-30 years range.

Major Findings

The second part of the SCI requested data on the climate of the school as perceived by the teachers. Two major research questions guided this study and both were answered by analyzing SCI data using Statistical Package for the Social Sciences software version 17.0. Descriptive statistics were first computed for all the variables in the study. The descriptive statistics included the mean, standard deviation, and minimum and maximum scores for overall school climate as well as for each of the four factors of school climate and for the Math CSEC Exam scores for all students in the 38 participating schools (See Table 7). The mean for each of the four factors of school climate was calculated by averaging the scores for all of the questions within each factor for the 962 teachers in the participating schools; the mean for the overall SCI represents an average of all the responses for all of the 28 survey items.

Table 7

Descriptive Statistics for the Variables in this Study

Variables	Mean	Standard Deviation	Minimum	Maximum
SCI	3.57	.32	2.79	4.23
Collegial Leadership	3.70	.53	2.14	4.50
Teacher Professionalism	3.73	.30	3.15	4.30
Academic Press	3.61	.38	2.46	4.41
Community Engagement	3.25	.49	2.18	4.43
CSEC Math Score	3.46	.76	2.08	4.95

N=38

The mean scores for the Math Exam represent a mean of all the mean scores for the schools. Reverse rule was used to calculate the mean math scores. The reason this technique was employed is that the CSEC exams are graded on a scale of one to six with one being the highest score and six being the lowest. On the other hand, the SCI is rated from one to five with one being the lowest score and five being the highest. For clarity in interpretation of results the researcher reversed the Math exam scores, converting a score of one to a score of six, a score of two to a score of five, etc., so that the largest number represented the highest exam score. Means were then calculated for each school and across all schools. Appendix H depicts this procedure for one set of scores in the study.

The mean score for the School Climate Index revealed that 22 schools (58%) had averages above the mean and 16 schools (42%) had averages below the mean. For the exam scores, 21schools (55%) had averages above the mean and 17 schools (45%) had averages at the mean and below.

Research Question One

One of the objectives of this study was to learn whether a significant relationship exists between school climate and student achievement. To answer this research question the researcher conducted a bivariate correlation analysis between overall school climate and the overall mean of the Math exam scores for participating schools. Table 8 presents the findings of this correlation analysis and also displays correlation analyses for each of the four factors of school climate.

Table 8

Pearson Product Moment Correlation Results for the Variables in this Study

	CL	TP	AP	CE	MES
1. SCI	.81**	.63**	.88**	.75 **	.33*
2. CL		.36*	.57**	.47**	.01
3. TP			.48**	.24	.07
4. AP				.71**	.57**
5. CE					.46**

Note. SCI=school climate index; CL= collegial leadership; TP = teacher professionalism; AP= academic press; CE= community engagement; MES=math exam score.
* $p < .05$. ** $p < .01$.

The results indicate that there is a significant and positive correlation between overall school climate and student achievement ($r = .33$, $r^2 = .11$, $p < .05$). It is important to note that although there is a significant relationship between the two variables, the correlation coefficient is weak. The r^2 value indicates that organizational climate explains 11% of the variance in student achievement scores in math. The graphical representation

of the relationship between school climate and student achievement is depicted in Figure 1 in the form of a scatterplot. This view also shows the weak positive relationship between school climate and student achievement.

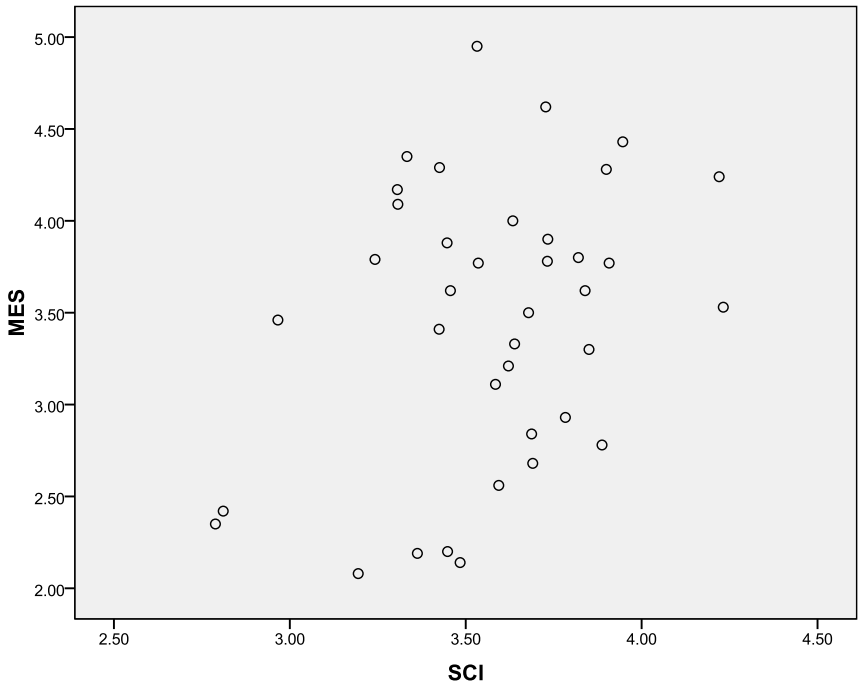

Figure 1: *Scatterplot Displaying the Relationship between Overall School Climate and Student Achievement.*

Note. MES= Math exam score; SCI= School climate index.

A closer look at the correlation analysis presented in Table 8 reveals interesting results for the subscales. The data indicate that of the four factors of school climate, academic press ($r = .57$, $r^2 = .32$, $p < .05$) and community engagement ($r = .46$, $r^2 = .21$, $p < .01$) were significantly correlated to math achievement. These two factors were both moderately correlated to math achievement. Collegial leadership ($r = .01$, ns) and teacher

professionalism (r = .07, ns) on the other hand, showed no significant relationship with math achievement.

The research hypothesis developed to address research question one was:

> H_{O1}: There is no significant relationship between overall teachers' perceptions of organizational school climate, as measured by the SCI, and overall student achievement scores as measured by the 2010 CSEC Mathematics exam in Belizean secondary schools.

In light of the findings, the null hypothesis was rejected because the study revealed that there is a significant relationship between the teachers' perceptions of school climate and student achievement in Belizean secondary schools (r =.33, p < .05). Furthermore, the findings revealed that two of the four factors of school climate (academic press and community engagement) were also significantly correlated to math achievement.

Research Question Two

The second research question focused on finding out the relative weight of each of the factors of school organizational climate (collegial leadership, teacher professionalism, academic press, and community engagement) as predictors of student achievement on the CSEC Math exams. This question was analyzed using multiple regression as this technique allowed the researcher to determine the independent effects of each of the school climate variables on math achievement. The enter method whereby all independent variables were simultaneously entered was used in the analysis. McClave, Benson, and Sincich (2008) identified the enter method as the standard method of regression. The results of the multiple regression analysis are displayed in Table 9.

Table 9

Regression Analysis for School Climate Variables

	CSEC Math	
Variable	Unstandardized *B* Coefficients	Standardized β Coefficients
Constant	0.10	
Collegial Leadership	-0.66	-0.46**
Teacher professionalism	-0.48	-0.19
Academic Press	1.65	0.82***
Community Engagement	0.22	0.14
R^2	.51	
ΔR^2	.45	
F	8.66***	

**$p < .01$. ***$p < .001$.

The results indicate that a significant model emerged using the enter method, $F(4, 38) = 8.66$, $p < .001$. The results displayed in Table 10 also indicate that the four climate variables had an overall positive effect on explaining the variance in Math scores in the 38 participating schools. More specifically, 45% of the variation in student achievement scores in Math can be explained by the four factors of organizational school climate combined ($R^2 = .51$, $\Delta R^2 = .45$). The adjusted R^2 value is used in interpreting variance explained because this statistic adjusts for sample size and number of independent variables in the model (Urdan, 2005).

The regression analysis for the individual factors of school climate reveal that only collegial leadership (B= -0.66, β= -0.46, $p < .01$) and academic press (B= 1.65, β= 0.82, $p < .001$) had significant independent effects on student achievement as measured by Math CSEC exam scores. Teacher professionalism (B= -0.48, β= -0.19, ns) and community engagement (B= 0.22, β= 0.14, ns) showed no significant independent contributions to explaining the variance in the CSEC Math scores.

The research hypothesis developed in this study to address research question two was:

> H_{O2}: There are no significant independent effects of any of the school climate factors— collegial leadership, teacher professionalism, academic press, and community engagement— on student achievement as measured by the 2010 CSEC math scores.

In light of the findings discussed above, the null hypothesis was rejected because the study revealed significant independent effects of two school climate factors on student achievement. Academic press and collegial leadership were found to have significant independent effects on student achievement while teacher professionalism and community engagement revealed no significant independent effects.

Summary

In summary, the findings of this study revealed significant relationships between school climate and student achievement in Belizean secondary schools. School climate had an overall statistically significant, but weak, relationship with student achievement as measured by 2010 CSEC math scores. Further correlation analysis of the subscales revealed that two of the factors, academic press and community engagement were

significant in relationship to math achievement. These factors are moderately correlated with achievement.

On the independent level, academic press and collegial leadership had significant effects on student academic achievement. The results indicate that the best possible overall predictor of math achievement in Belizean secondary schools is academic press. The findings presented in this chapter will serve as the premise for the discussions and recommendations of the next chapter.

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The purpose of this chapter is to present the summary and conclusions of the study, and recommendations for future research and policy as they relate to school climate. The first part of this chapter presents a summary of the study and a discussion of the limitations. Findings are discussed, the implications for research and practice are suggested, and recommendations are outlined.

Summary of the Study

Educational institutions around the world face varying degrees of pressures from stakeholders as demands often encourage change and improve standards. The Belizean educational system is in no way immune to the demands of an ever-changing society, and as school leaders strive to meet such demands, they continue searching for creative and innovative ways to improve the teaching-learning process.

Considering that standardized tests are critical components of educational systems and many schools are "graded" in the eyes of the public by the success of the students on standardized tests, school leaders seek to improve their schools by improving test scores. Cruickshank, Jenkins, and Metcalf (2009) pointed out that in the United States "calls for greater accountability for students' learning and more rigorous standards have led nearly all states to require students to pass standardized tests at several grade levels" (p.300). The literature indicates that school climate is fast becoming an intriguing concept for school administrators since this concept has been found to have a positive effect on achievement (Goddard, Sweetland & Hoy, 2000; Heck, 2000; Hoy & Hannum, 1997;

Johnson & Stevens, 2006; Smith, 2002; Tschannen-Moran, Parish & Dipaola, 2006; Uline & Tschannen-Moran, 2008).

This research study adds to the body of literature on school climate. Since most school climate studies were done in developed countries, this study is of significance because it sought to ascertain if a relationship exists between school climate and student achievement in a developing country. Information gathered can be compared to results from developed countries to see if the concept of school climate has the same effect in a different setting. More importantly, the results of this study can benefit policy makers and school leaders in Belize, the setting in which it was conducted.

The purpose of this study was to find out if a relationship exists between organizational school climate and student achievement in Belizean secondary schools, and to explore whether the various factors of school climate have independent effects on achievement. To measure school climate, the researcher used a consolidated framework developed by Tschannen-Moran, Parish and Dipaola (2006). Many school climate instruments have been used to study the effects of school climate but the researcher chose this framework because of its conciseness in measuring climate. The developers of this instrument combined a number of the school climate variables of other frameworks and developed a consolidated framework that measures the four major levels of interactions within an educational organization (principal-teacher, teacher-teacher, teacher-student, and school-community) in a precise 28-item survey. This SCI encompasses the factors of collegial leadership, teacher professionalism, academic press and community engagement. The researcher added an 8-item section to collect demographic data of the

participants. The final survey instrument had a total of 36 items and required approximately 15 minutes to complete.

After seeking permission from the principals of Belize's secondary schools, the researcher conducted the survey at faculty meetings as scheduled by the principal. The results of the survey instrument revealed the perceptions of the teachers of their school's climate. To measure student achievement, the researcher gathered 2010 CSEC Math exam scores for each school from the Quality Assurance and Development Services in the Ministry of Education and Youth in Belize. After the data were collected, the researcher analyzed the data using Statistical Package for the Social Science, version 17.0. Two research questions guided the study; the first was as follows:

> What is the relationship between overall organizational school climate as measured by the SCI, and student achievement on the 2010 CSEC Math exams in Belizean secondary schools?

To answer this question, the researcher calculated mean exam scores and mean climate scores per school. Bivariate correlation analysis was conducted and Pearson *r* correlation coefficient was calculated. The second research question allowed for further analysis to be done. This research question was as follows:

> What is the relative weight of each of the factors of school organizational climate—collegial leadership, teacher professionalism, academic press, and community engagement— in relation to student achievement on the 2010 CSEC Math exams?

A multiple regression was employed to answer this question. The simultaneous or forced entry method was used and the Beta values that emerged were used to determine how

strongly and in what direction each predictor variable (collegial leadership, teacher professionalism, academic press, community engagement) influenced the math achievement scores.

Discussion of Limitations

The discussion of the findings would not be thoroughly addressed if the limitations of this study were not taken into consideration. Some of the limitations of this study follow and serve as an opportunity for future researchers to refine the study by addressing these issues.

1. The SCI measures the perceptions of teachers, which means that this survey instrument yielded subjective results. The subjective responses of the teachers may not necessarily be a genuine description of the organization's climate, and this could have resulted in the reporting of incorrect results.
2. This study involved the perceptions of full-time teachers only. Administrators, adjunct faculty, support staff, parents, and students were not a part of this study. These other individuals make up a part of the organization and have an effect on the organization; thus, their responses might have provided a valuable counterpoint to the responses of the teachers.
3. In terms of timeframe, a gap existed between the time the data were collected for the School Climate Index and when the exams were taken. Students sat their Math CSEC exam in June 2010, and the teachers were surveyed in the period of February to April 2011. This means that the climate of the school was being measured a school year after the exam was taken. School climate may have changed somewhat in the intervening time, and this gap in time could have

impacted teachers' perceptions and could have lead to the reporting of inaccurate results.

It must be noted, however, that school climate has been found to be a stable quality**.** Hoy, Hannum and Tschannen- Moran (1998) studied the effects of school climate and achievement in 86 New Jersey middle schools and compared their results to a similar study on the same population two years earlier and found that "the impact of a school's climate is relatively enduring" (p. 353). The findings of the study conducted by Hoy, Hannum and Tschannen-Moran supports the idea that school climate is lasting and, as such, would lessen the effect of this limitation. However, such a study demonstrating the enduring quality of school climate has never been conducted in a setting similar to which this current school climate study is set; thus further research on the lasting effect of the school climate concept would be needed before any further conclusions could be drawn.

4. School climates can be studied from varying angles and using several different instruments. This study focused entirely on the use of the SCI; thus, its findings are limited to the factors measured by this instrument. All other possible definitions of school climate were excluded when this instrument was selected. Many aspects of school climate, such as the social component, are not encompassed by this instrument and thus not addressed in this study.
5. Achievement is a concept that can be measured in various ways. For the purposes of this study, achievement was measured solely by mean scores from a standardized exam. The latter does not fully reflect the achievement of a school as achievement could be based on growth, percent of students who are successful,

etc. Furthermore, only math scores were used to measure achievement. As a result, no conclusions can be drawn regarding the effect of school climate on other subject areas.

6. This study investigated the effect of school climate on student achievement without considering the effect of socioeconomic status. The latter has been found to be a strong predictor of achievement in developed countries (Klinger 2000; Okpala, Okpala & Smith, 2001; Sofroniou, Archer & Weir, 2004). As a result most studies on school climate and achievement consider the effects of socio-economic status (Hoy & Hannum, 1997; Hoy, Hannum, & Tschannen-Moran 1998; Johnson & Stevens, 2006; Smith, 2002; Uline & Tschannen-Moran, 2008). Smith and Hoy (2007) stated that "one consistent finding on school effects is the strong influence of socioeconomic status (SES) on achievement" (p. 557). Dipaola and Hoy (2005) asserted that "no study on student achievement is complete without considering the impact of SES on student achievement" (p. 380).

   Although the absence of SES as an independent variable in this study serves as a limitation, it is also important to note that the effect of this variable is largely dependent on the context of its use in achievement studies. White (1982) argued that educators should be very careful of the context in which SES is used and purports that when the school is used as an aggregated unit (as is the case in many school climate studies), SES and academic achievement are strongly correlated; but when the student or the individual is used as the unit of analysis, SES and achievement are weakly correlated. Currently in Belize, only district

poverty rates are available for use and imputing this factor to all schools in the district may not quite be an accurate picture of the SES of the students in a particular school. Considering that context and definition of SES have varying effects on achievement studies, much thought has to be given to how SES of students and schools would be measured in a developing country like Belize before it can be factored as a variable into studies such as these.

The limitations outlined above are important aspects to consider particularly when discussing the findings and implications of this study.

Discussion of Findings

This study yielded several findings. Discussion of the findings of this study will include comparisons to findings from similar studies done in the United States since the researcher was unable to find any such study having been conducted in a developing country. It also must be noted here that not many studies employing the specific School Climate Index used in this study have been found in the literature, but comparisons will be made to studies using several climate instruments and, in particular, to one study in Virginia using a similar instrument.

The first major finding of this study is that school climate has a significant and positive relationship with achievement in Belizean secondary schools. This finding is similar to those of research studies conducted in Virginia, Ohio, and New Jersey schools. The results of the studies in these states revealed moderate to strong relationships between school climate and achievement (Hoy & Hannum, 1997; Smith, 2002; Tschannen-Moran, Parish & Dipaola, 2006). It is important to note that the relationship

found in the Belizean setting is a weak positive relationship, but nonetheless, a significant one.

The second major finding was with regard to the relationship between the subscales of school climate and achievement. This current study reveals that only two of the subscales of school climate— academic press and community engagement—were significantly correlated with math achievement while the other two subscales, teacher professionalism and collegial leadership were not. Academic press had the highest correlation, and community engagement was next. A similar study done in Virginia using a similar instrument (Tschannen-Moran, Parish & Dipaola, 2006) revealed that three of the subscales— teacher professionalism, academic press, and community engagement— were significantly correlated with math achievement. For the Virginia study, community engagement had the highest correlation and academic press closely followed. The Virginia study and this study did not reveal significant relationships between collegial leadership and math achievement in the correlation analysis.

The multiple regression analysis revealed a third major finding of this study; collegial leadership is a significant negative predictor of math achievement. This is not evidenced in any of the previous school climate research. A study of middle schools in New Jersey (Hoy & Hannum, 1997) found no independent effect of collegial leadership on math achievement. This highlights an interesting aspect of school climate because this finding indicates that for the Belizean setting, as the level of collegial leadership increases the students' academic achievement decreases.

A final major finding of this study is that academic press is the most consistent and positive predictor of math achievement in Belizean secondary schools. This subscale

of school climate revealed a significant positive correlation with academic achievement as well as emerged as the most significant predictor of academic achievement in the multiple regression analysis. Previous research supports this finding in that most of the school climate studies done in the United States revealed that academic press is a significant predictor of academic achievement and, in particular, math achievement (Goddard, Sweetland, & Hoy, 2000; Hoy & Hannum, 1997; Hoy & Sabo, 1998; Smith, 2002). In contrast, the study in Virginia found that only community engagement had independent effects on math achievement.

Conclusions

Several conclusions can be drawn based on the findings of this study and these are now presented. It can first be concluded that the climate in a school affects the academic performance of the students attending that school. School climate encompasses several different factors but, as presented in this study, the major interactions occurring in an organization such as a school involve the principal-teacher, teacher-teacher, teacher-student, and school-community relationship. This study indicates that overall school climate that encompasses these horizontal and vertical linkages has a significant positive effect on achievement. If students are to excel in school, they need to be in an environment that provides positive interactions among the different individuals in the school environment and at all levels of the school organization. This serves as a crucial starting point for stakeholders in the Belizean education system as they seek ways of improving success among students.

The two subscales of school climate that revealed significant correlations with academic achievement—academic press and community engagement— indicate that

these two attributes are worth assessing if there is an interest in improving academic performance of students. It appears that schools that emphasize and acknowledge the academic achievements of students tend to be more successful than schools that do not. Similarly, if schools foster positive relations with the community such as involving them in planning of school activities and in regular discussion of school issues, there could be a positive effect on student achievement.

In the Belizean setting, the teacher professionalism subscale does not have a significant relationship with student achievement. That is not to say, however, that this subscale is not important; teacher interactions make up an integral part of a school's climate, and as mentioned earlier, there is an overall significant relationship between school climate and student achievement. The effects of teacher professionalism on achievement in Belizean schools may not be direct but may work through other mediating factors.

Sweetland and Hoy (2000) studied 86 New Jersey middle schools and found a significant correlation between teacher professionalism and teacher empowerment and the latter made significant independent contributions to math and reading achievement. This study revealed the indirect effect that teacher professionalism may have on achievement. If teachers work together, respect each other, and accomplish their job with enthusiasm, this could add to a healthier school environment which could then lead to improved student success**.** Thus, the effect of teacher professionalism on student achievement in Belizean schools may not be direct. No further conclusions on the effect of this subscale on academic achievement in Belizean schools can be drawn without further research.

With regard to the collegial leadership subscale, it can be concluded that a type of leadership that is friendly and open may not be effective for the Belizean setting. Further research must be conducted before any definitive inferences can be drawn about this finding, but it might be surmised that the culture of the schools in Belize and the country as a whole may be a possible reason for this finding. The effects of principals in a school are usually manifested through the teachers. In general, Belizean teachers and even the students may function better in a structured environment where routines are set, there is constant monitoring, and there is a top-down approach to decision-making. One example of a type of leadership characterized by these tenets is instructional leadership. "The instructional leadership model is somewhat more 'top-down' with an emphasis on coordinating and controlling others to move toward goals that may have been set at the top of the organization" (Hallinger, 2003, p.343). Attributes of the collegial leadership model may not be quite suitable to the Belizean educational setting. Probably due to the culture that currently exists in Belize, teachers in Belizean secondary schools may not feel that they should be a part of the decision-making process in a school or may not be comfortable with the principal treating them as his/her equal. Rather, they may prefer the more directive approach offered, for example, by the instructional leadership model or other types of leadership that are non-collegial.

Hallinger (2003) stated that the context of the school should be taken into consideration when trying to fit a leadership model to a school. Schools that need to be transformed from low-achieving to high-achieving may need leaders who are goal-oriented and hands-on such as instructional leaders who would focus on improvement while other schools may not need such an approach. A fairly young, independent nation

like Belize is characterized with an educational system that is in a young growth stage; likewise, the schools in this system have just started on the journey of school improvement. These schools may function better with leaders other than collegial leaders.

Another possible explanation for the inverse relationship that was found between collegial leadership and achievement could be the level of teacher dissatisfaction existent in some of the schools. The researcher observed that in some of the schools teachers were more than willing to rate their principals poorly and used the survey instrument as a medium to voice their dissatisfaction. Regardless of what the possible reasons are for the findings on collegial leadership, it is important to note that this particular finding serves as a stepping stone for a very intriguing future research on educational leadership in Belize.

The final conclusion that can be drawn from this study is that the best predictor of academic achievement in Belizean schools is academic press. Schools that set high standards for academic performance, set an orderly and serious learning environment, and maintain definite standards of performance tend to do better academically than schools that do not. Since this study reveals that this subscale of school climate has such a significant effect on academic achievement in Belizean secondary schools, the academic press subscale serves as a crucial area for Belizean school administrators and policy-makers to consider when focusing on academic success of secondary school students in Belize.

Implications

School climate research is fast becoming an interest to stakeholders in education because of the numerous findings that indicate its positive relationship with academic achievement. The findings of this study have implications for research and practice.

Implications for Research

This study built on the literature to determine if there is a positive relationship between school climate and student achievement in a developing country. Most school climate studies have been conducted in the United States; however, this study provides insight into school climate in a totally different cultural setting. The structure, dynamics, management, and systems of schools in Belize, and Belizean culture in general, differ from those of the United States, so conducting a school climate study in this context adds to the body of school climate literature. Although this study, like others done in the United States, showed a significant positive relationship between academic achievement and school climate, it also discovered some unique findings that might be a direct effect of the setting of the study. This study implied that overall school climate has a positive relationship with student achievement in Belizean secondary schools with the academic press factor emerging as the best predictor of academic success in math achievement. Educators need to be cognizant of the effects of school climate on student achievement as well as the effect of the different components of school climate on achievement as they continue to seek ways of improving their schools.

The conceptual underpinnings of this study lies in the work of Tschannen-Moran, Parish and Dipaola (2006) who developed a consolidated school climate framework based on the work of previous school climate research. The work of Tschannen-Moran

and Dipaola (2006), has now been extended to a developing country as this study continues to test the usability of this framework in new school environments. This study continues to establish the importance of the use of this framework because the school climate construct as measured by this framework was seen to have a significant positive relationship with student achievement. The academic press component of the framework continues to surface as a significant predictor of academic achievement. The other three subscales remain significant facets of the school climate framework as they do have a positive correlation with school climate, which in turn has a significant relationship with achievement.

Implications for Practice

This study has practical significance because it provides relevant information usable to the setting in which it was conducted. The major findings of this study are that there is a significant positive relationship between school climate and student achievement, and that academic press seems to be the best predictor of academic achievement in Belizean schools. This is information that can be used from top to bottom and across levels of the education system. At the highest level, policy-makers can use these results to make informed decisions about the future of Belizean schools. Policy-makers can use these findings to inform discussions and decisions about budgeting for teacher and principal training. Through continuous professional development workshops offered by the Ministry of Education and Youth (MOE &Y), school administrators can be introduced to the crucial conceptual underpinnings of school climate and can be offered guidance on how improvements in this area can improve academic success of students.

At the level of the school there is much to be gained. To begin with, this study has brought to the Belizean educational system an instrument that can be used readily and easily to measure the climate of schools. School leaders can use this instrument for both formative and summative purposes. School leaders can collect data from their faculty in fewer than 15 minutes, and use this information for needs assessment. After interventions have been implemented, the school climate survey could be used again to evaluate the effectiveness of the interventions and to chart the way forward for future improvement. This survey collects information on the relationships between students and teachers, teachers and teachers, administration and teachers, and school and the community. Four major areas of the school system are addressed, so the information gathered can be used to speak to school improvement plans and schools' strategic planning.

This study also has major practical implications for secondary school administrators in light of the newly introduced Secondary Education Reform Initiative. The latter is an initiative of the Ministry of Education and Youth in Belize to address school dropout and repetition, increase access to secondary education, and address overall social ills in the nation by focusing on a new method of financing for secondary schools. This reform initiative is expected to improve access and equity, attain social justice and make it more affordable for parents to send their children to high school. Monies will be allocated to schools on a per-student basis, and schools that enroll a high number of special academic needs students will receive more funding (Ministry of Education & Youth, Belize, 2011).

The implication of this reform initiative is that schools will be encouraged to enroll more students and become more effective and efficient in the process of increasing

quality in education. Therefore, principals and other school administrators will need to be creative in developing programs in their schools that will ensure the success of all students, especially those who have special academic needs. If Belizean secondary schools are to embrace this new initiative and remain viable and competitive in the changing secondary education climate in Belize, schools will need to start doing things differently.

This study is timely in that it reveals findings that can definitely speak to this reform initiative. According to this study, the best predictor of achievement in Belizean secondary schools is academic press. School administrators, in their efforts to meet the challenges of the secondary education reform initiative, can reflect on how academic press can be improved in their schools. If schools are able to find ways to increase academic press student success may be improved. In effect drop-out rates could decrease and the mission of the schools would then be aligned with the goals of the Ministry of Education and Youth. This could eventually guarantee maximum output for the Belizean education system.

Recommendations

In general, this study offers information that can be used by any person interested in increasing academic achievement of students. A few recommendations with regard to the Belizean education system and recommendations for future research follow.

Recommendations for Belizean Educators

Many factors affect achievement, and one of the roles of educators is to ensure that children learn regardless of all the variables that may obstruct this process. Parents, the community, and society as a whole expect schools to produce children who can

survive and be productive when they leave school. This presents no easy task for administrators, but the quest continues for best practices to ensure the academic success of children.

Based on the overall findings of this study, the following recommendations are presented:

1. Educators should be cognizant of the climate that exists in a school because it does affect academic achievement. Principals in particular need to be mindful that the climate of a school affect achievement and the former can be enhanced to improve results.
2. Educators need to foster positive relationships between and among teachers and students. These positive relationships add to a positive school climate which has a positive effect on achievement.
3. School leaders need to find ways of including the community in the life of the school and foster positive relationships with the community. It is important that schools involve the community not only in fundraising activities but also in the planning of different school activities. Improved school-community relations can also have a positive effect on school climate which in turn has a positive effect on achievement.
4. School leaders should design school improvement plans that entail the school climate construct. This study reveals that school climate has a significant relationship with student achievement, so including it in the school improvement plan could lead to improved academic achievement.

5. Educators need to seek ways of creating an environment that is serious, orderly and pushes the students towards academic success. Such an environment is characteristic of a school with high academic press and according to this study the latter is a significant predictor of student achievement.

Considering that this study revealed the best significant independent predictor of student achievement in Belizean secondary schools is that of academic press, the following practical guidelines are suggested for educators who wish to improve academic success by increasing academic press. These guidelines are applicable to principals in their schools, teachers in their classrooms, and even to parents in their homes as they assist their children in becoming successful students and productive citizens.

1. Set high but achievable academic goals for students and hold them accountable.
2. Develop programs to acknowledge and merit academic success of the students.
3. Develop a collaborative environment for students where they learn to work together and learn to celebrate success together.
4. Foster an environment of asking questions and clarifying answers.
5. Allow students the opportunity to redo work and reward them for it so that they learn that it is important to try until one succeeds.
6. Provide a wide range of activities aimed at intellectual stimulation.
7. Create an environment for learning that is serious and orderly.
8. Use the results of student assessment to make data-driven decisions to help the student improve academically.

Following the above guidelines could lead to increased academic press which, according to this study, is a crucial aspect of improving academic achievement.

Recommendations for Further Research

This study, only the beginning of many school climate research studies to be done in a developing country, has revealed some unique findings that open avenues for future research. The following are suggestions for further research in the same area of study:

1. The perceptions of administrators, students and parents were not included in this study; a study that involves the perceptions of these individuals would be informative to understanding climate considering that they comprise a large portion of a school's population and contribute greatly to the school's climate.
2. This study focused only on the subject of math; a study of the effects of school climate on achievement in other academic subjects in a developing country could add to the understanding of the impact of climate on student achievement. Most studies in the United States look at effects of school climate on math, English, reading, and writing.
3. A school climate study at the post-secondary level or at the elementary level in Belize would also provide some useful results. This study was limited to high schools, so similar studies conducted at different levels may be helpful to expand the understanding the impact of climate on student achievement. Many school climate studies have been conducted in developed countries at the middle school, high school, and elementary level.

4. The effect of collegial leadership on academic achievement definitely needs some further investigation. This study revealed significant, but inverse effects, which are contrary to findings in developed countries. This unique finding could better be generalized with follow-up studies.
5. Studies on the concepts of teacher professionalism and community engagement in Belizean schools should be conducted. These concepts are important attributes of a school's climate, and although the latter was found to be correlated with achievement, this study did not provide enough evidence of both factors independent predictive effects on academic achievement. Further studies using this particular instrument are needed.
6. This instrument was recently developed as a consolidated framework since many of the previous school climate instruments were found to be too cumbersome. More studies using this new instrument are needed in various settings so that more specific comparisons in findings can be made.

Concluding Remarks

Decades of research on school effectiveness and organizational change have shown that school climate and specific factors such as academic press impact the effectiveness of organizations (Bossert, Dwyer, Rowan & Lee, 1982; Brookover & Lezotte,1979; Edmonds, 1979; Goddard, Sweetland & Hoy, 2000; Griffith, 1999; Heck, 2000; Hoy & Hannum, 1997; Hoy & Sabo,1998; Smith, 2002; Sweetland & Hoy, 2000; Uline & Tschannen-Moran, 2008). This study adds to this body of knowledge as it also found that school climate has a significant effect on student achievement and that academic press is the best and most consistent predictor of student achievement. This

study is unique in that it extends the school climate literature to the context of a developing country. It also introduces to the Belizean educational system a very practical instrument that can be used by educators to assess their schools. Considering that the concept of school climate is fairly new to the Belizean educational system, this study is significant in that it has opened new avenues for stakeholders to consider when looking at school improvement and change in Belizean schools.

As education continues to evolve and pressures of accountability continue to affect schools on a daily basis, school administrators and other stakeholders in education need to continue to look for ways of improving the academic success of their students. Schools operate as service organizations, thus, every school in every community should ensure that they provide stimulating environments that foster development of all children and inspire them to do their best. The hope of this researcher is that the school climate construct will continue to be an integral part of the school improvement process. The school administrator and teachers may not have any control over a child's socioeconomic status, level of poverty, or parental support that the child gets, but the administrator and teachers do have a major influence over the type of environment that a child experiences. This environment created for the child can determine the success or failure of that individual.

It is high time that schools in Belize focus on raising standards to ensure that the Belizean children have an equal opportunity to compete in the international market. This definitely will not happen overnight but with persistent efforts it can happen. One good way to start is by examining the climate of the schools in Belize. An improvement in

schools will eventually lead to more successful students, who will eventually become more productive citizens in our country.

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Appendix A

Number of Teachers in Belizean Secondary Schools by District, Gender and Management 2009/2010

District	Management				
	Government	Government-Aided Community	Government-Aided Denominational	Private/Specially Assisted	Total
Total	510	161	565	65	1301
Belize	184	24	236	21	465
Cayo	90	0	167	26	283
Corozal	40	52	46	6	144
Orange Walk	69	0	81	8	158
Stann Creek	76	35	35	0	146
Toledo	51	50	0	4	105
Males	263	65	232	37	597
Belize	72	9	89	12	182
Cayo	45	0	80	13	138
Corozal	21	17	20	5	63
Orange Walk	42	0	30	4	76
Stann Creek	47	16	13	0	76
Toledo	36	23	0	3	62
Females	247	96	333	28	704
Belize	112	15	147	9	283
Cayo	45	0	87	13	145
Corozal	19	35	26	1	81
Orange Walk	27	0	51	4	82
Stann Creek	29	19	22	0	70
Toledo	15	27	0	1	43

Source: Education Statistical Digest of Belize 2009/2010. Policy and Planning Unit, Ministry of Education, Belize.

Appendix B

SCHOOL CLIMATE SURVEY

A. DEMOGRAPHIC DATA

1. In which district is your school?

____ 1. Corozal ____ 3. Belize ____ 5. Stann Creek

____ 2. Orange Walk ____ 4. Cayo ____ 6. Toledo

2. In which area is your school? ____ 1. rural ____ 2. urban

3. Your age:

____ Below 20 years
____ 21-25 years
____ 26-30 years
____ 31-35 years
____ 36-40 years
____ 41-45 years
____ 46-50 years
____ Above 50 years

4. Your gender: ____ 1. female ____ 2. male

5. Your ethnicity:

____ 1. Creole ____ 4. Maya ____7. Caucasian

____ 2. Mestizo ____ 5. East Indian ____ 8. Mixed Ethnicity

____ 3. Garifuna ____ 6. Asian ____ 9. Other, specify _____

6. How many years teaching experience do you have?

____ 5 years or less ____ 11-15 years ____ 21-25 years

____ 6-10 years ____ 16-20 years ____ 26 years or more

7. What is the highest level of education you have? (Check only highest level reached)

____ 1. Primary School Certificate ____ 5. Level Two Teacher's Certificate

____ 2. High School Diploma ____ 6. Bachelor's Degree

____ 3. Associate Degree ____ 7. Master's Degree or higher

____ 4. Level One Teacher's Certificate ____ 8. Other, please specify _____

8. What class/es do you currently teach?

____ Form 1 ____ Form 2 ____ Form 3 ____ Form 4

B. SCHOOL CLIMATE INDEX (see next page)

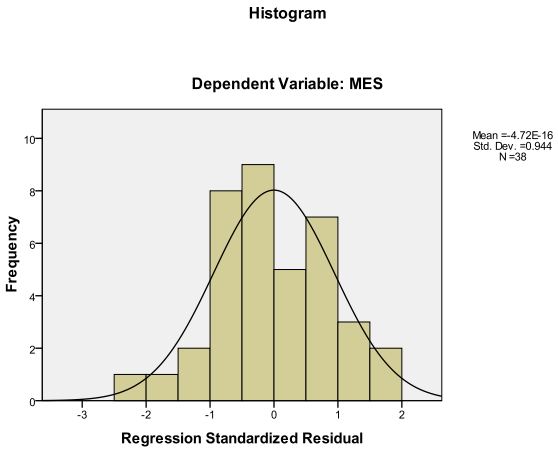
School Climate Index

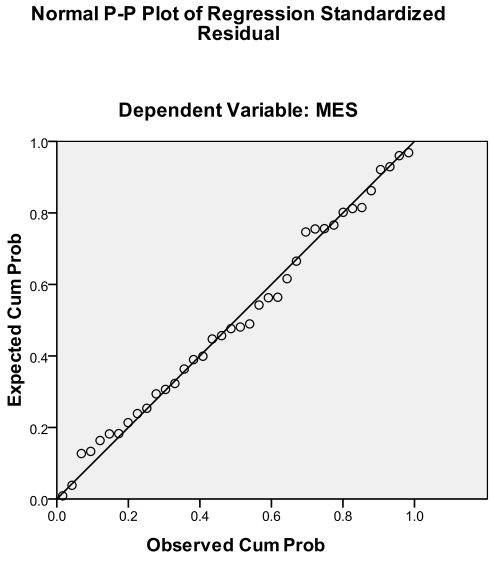
Directions: The following are statements about your school. Please indicate the extent to which each occurs, from Never (1) to Very Frequently (5).		Never	Rarely	Sometimes	Often	Very Frequently
1.	Our school makes an effort to inform the community about our goals and achievements.	1	2	3	4	5
2.	Our school is able to marshal community support when needed.	1	2	3	4	5
3.	The interactions between faculty members are cooperative.	1	2	3	4	5
4.	Teachers respect the professional competence of their colleagues.	1	2	3	4	5
5.	The school sets high standards for academic performance.	1	2	3	4	5
6.	Students respect others who get good grades.	1	2	3	4	5
7.	The principal is friendly and approachable.	1	2	3	4	5
8.	The principal puts suggestions made by the faculty into operation.	1	2	3	4	5
9.	Parents and other community members are included on planning committees.	1	2	3	4	5
10.	Community members are responsive to requests for participation.	1	2	3	4	5
11.	Teachers help and support each other.	1	2	3	4	5
12.	Teachers in this school exercise professional judgment.	1	2	3	4	5
13.	Teachers are committed to helping students.	1	2	3	4	5
14.	Academic achievement is recognized and acknowledged by the school.	1	2	3	4	5
15.	Students try hard to improve on previous work.	1	2	3	4	5
16.	The principal explores all sides of topics and admits that other opinions exist.	1	2	3	4	5
17.	The principal treats all faculty members as his or her equal.	1	2	3	4	5
18.	Teachers accomplish their jobs with enthusiasm.	1	2	3	4	5
19.	Teachers "go the extra mile" with their students.	1	2	3	4	5
20.	Teachers provide strong social support for colleagues.	1	2	3	4	5
21.	The learning environment is orderly and serious.	1	2	3	4	5
22.	Students seek extra work so they can get good grades.	1	2	3	4	5
23.	The principal is willing to make changes.	1	2	3	4	5
24.	The principal lets faculty know what is expected of them.	1	2	3	4	5
25.	The principal maintains definite standards of performance.	1	2	3	4	5
26.	Community members attend meetings to stay informed about our school.	1	2	3	4	5
27.	Organized community groups (e.g., PTA, PTO) meet regularly to discuss school issues.	1	2	3	4	5
28.	School people are responsive to the needs and concerns expressed by community members.	1	2	3	4	5

Note: Section B of this survey was downloaded from http://wmpeople.wm.edu/site/page/mxtsch Permission for use was granted from Dr. Megan Tschannen-Moran, associate professor in the College of William and Mary School of Education.

Appendix C

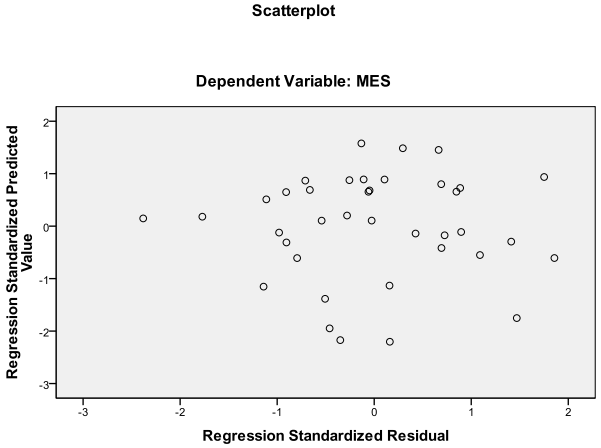
ASSUMPTIONS FOR MULTIPLE REGRESSION ANALYSIS

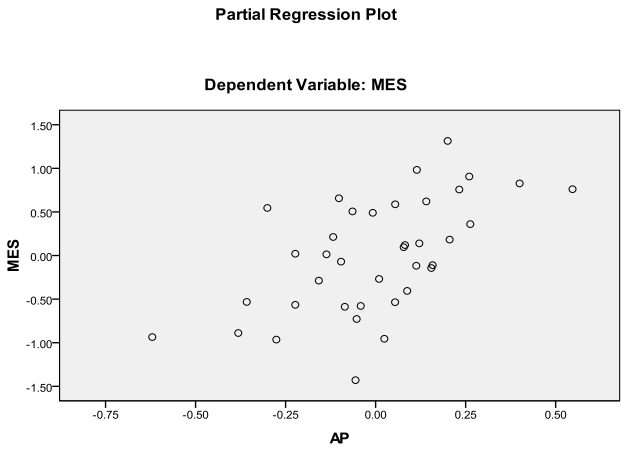




Appendix C (Cont'd)

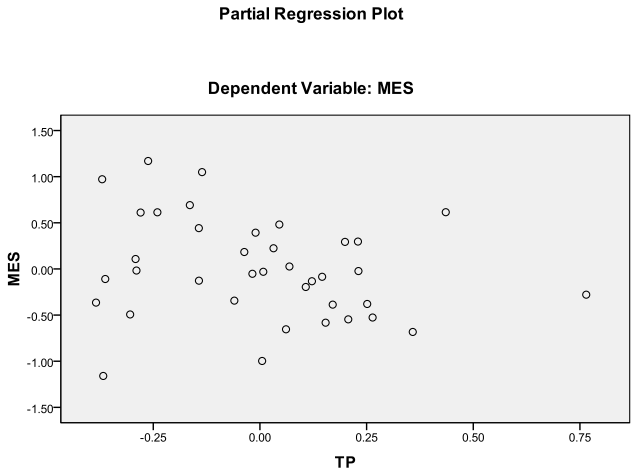
ASSUMPTIONS FOR MULTIPLE REGRESSION ANALYSIS

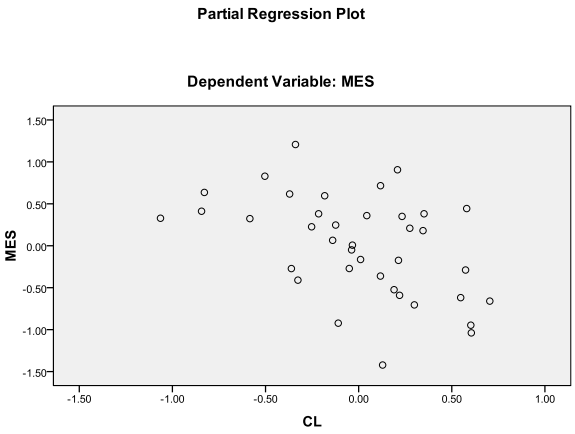




Appendix C (Cont'd)

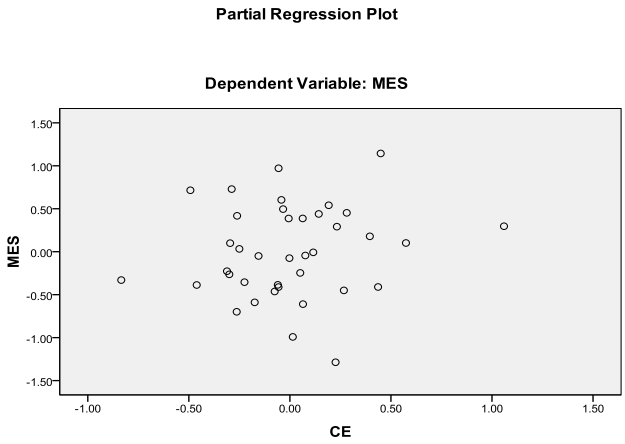
ASSUMPTIONS FOR MULTIPLE REGRESSION ANALYSIS





Appendix C (Cont'd)

ASSUMPTIONS FOR MULTIPLE REGRESSION ANALYSIS



Appendix D

Okla. State Univ.
IRB
Approved 2/10/11
Expires 2/9/12
IRB # ED-11-19

Letter to School Administrators

Date:

Dear School Administrator:

You and your faculty are invited to participate in a research study being conducted by Dian Vasquez, a doctoral student at Oklahoma State University, to investigate the effect of Organizational Climate on Student Achievement. Your school was selected to participate in this study because it is one of the Secondary Schools in Belize that prepares students to sit the Caribbean Secondary Education Certificate Exams. The focus of this research is to investigate what type of school climate nurtures proficiency in Mathematics achievement in Belizean secondary schools.

For this study, the researcher will utilize a survey that will take approximately fifteen minutes to complete. I would like to attend one of your regularly scheduled faculty meetings and ask the teachers to complete the survey at that time. I will collect the surveys as soon as they are completed.

There are no risks to those responding to the survey. The information collected cannot in any way be traced to respondents. Data from this study will be stored in a folder in a locked cabinet in the researcher's office for two years from the beginning date of the study and will be destroyed at the end of that period. Data analysis will be done on a non-networked, password-protected computer to which only the researcher will have access.

If you have any questions about this research project, please feel free to contact Dian Vasquez, #3 Piccini Site, Belize City, Belize, 501-660-1093, dian.vasquez@okstate.edu or Dr. Bernita Krumm, 310 Willard Hall, Stillwater, OK 74078, 405-744-9445, bernita.krumm@okstate.edu.

Participation is voluntary, and your school may discontinue at any time. Thank you for your willingness to participate in this research.

Dian Vasquez, M.Ed, Education Leadership, #3 Piccini Site, Belize City, Belize, 501- 660-1093, dian.vasquez@okstate.edu

Bernita Krumm, Ph.D., Education Leadership, Oklahoma State University, 310 Willard Hall, Stillwater, OK 74078, 405-744-9445, bernita.krumm@okstate.edu

Appendix E

PARTICIPANT INFORMATION FORM
OKLAHOMA STATE UNIVERSITY

Project Title: Organizational Climate and Student Achievement in Belizean Secondary Schools

Investigator:
Dian Vasquez, M.Ed.; Doctoral Candidate, Oklahoma State University

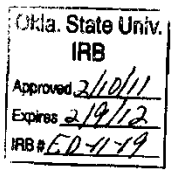
Purpose:
This study on Organizational Climate involves research in secondary schools in Belize. The study focuses on the question of what kind of school climate nurtures proficiency in Mathematics in Belizean secondary schools. As a teacher of such an institution, you are being asked to participate. The information being gathered in this study involves your perception as a secondary school teacher of your school's climate.

Procedures:
You are being asked to participate in this study by filling out a school climate survey known as the School Climate Index. This school climate instrument has two sections as follows: Section A has eight demographic items relevant to this study and Section B has 28 items relating to the following components of school climate: collegial leadership, academic press, teacher professionalism, and community engagement. Section A has been added to the original instrument to ensure that an accurate description of the population being surveyed is reported in the study. This instrument does not take more than fifteen minutes to complete and will be collected from you as soon as you have finished completing the survey.

Risks of Participation:
There are no known risks associated with this project which are greater than those ordinarily encountered in daily life.

Benefits:
The results of this study will be made available to you so that as a Belizean educator you can become more aware of what type of school climate affect achievement in secondary schools.

Confidentiality:
All information collected from you will be kept strictly confidential. The completed surveys will be stored in a locked cabinet for which only the researcher will have access. This data will be kept for two years from the date of collection and will be destroyed after this period of time. All the data collected will be recorded using assigned numbers rather than names. The data will be reported as a school and not as individual scores and so the data cannot be traced back to you. Data analysis will be done on a non-networked pass-word protected computer of which only the researcher will have access to. One foreseeable risk to confidentiality of this data is the transportation of the completed surveys. This will be minimized by the researcher personally collecting the surveys from you as soon as you have completed them. Results from this research study may be presented at professional meetings or in



publications.

Compensation:

No compensation will be given for participating in this survey.

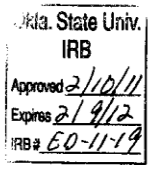
Contacts:

If you have any questions about this research project please feel free to contact Dian Vasquez, #3 Piccini Site, Belize City, Belize, 501-660-1093, dian.vasquez@okstate.edu or Dr. Bernita Krumm, 310 Willard Hall, Stillwater, OK 74078, 405-744-9445, bernita.krumm@okstate.edu.

If you have questions about your rights as a research volunteer, you may contact Dr. Shelia Kennison, IRB Chair, 219 Cordell North, Stillwater, OK 74078, 405-744-3377 or irb@okstate.edu.

Participant Rights:

Your participation in this project is appreciated and completely voluntary. You may choose not to participate at any time without any penalty or problem. Returning your completed survey indicates your willingness to participate in this study.



Appendix F

Okla. State Univ.
IRB
Approved 2/10/11
Expires 2/9/12
IRB # ED-11-79

Letter to Local Registrar

Date:

Dear Local Registrar:

My name is Dian Vasquez and I am currently pursuing a doctoral degree from Oklahoma State University. Part of my degree requirement stipulates that I conduct a research study, and I have decided to conduct a study in Belizean secondary schools to investigate the effect of Organizational Climate on Student Achievement. More specifically, I am seeking to find out what type of school climate nurtures proficiency in Mathematics in Belizean secondary schools.

In light of this, I am requesting access to the 2010 CSEC Math results for all students who sat this exam in the country. For this study I do not need the names of any students. I only need the individual math score for each student, the name of their school, and the composite score for each school.

Please note that any information given to me will be kept strictly confidential. The information will be stored in a locked cabinet for which only I will have access. This information will be stored from the date of receipt for a period of two years after which it will be destroyed. When conducting data analysis, it will be done on a non-networked, password-protected computer to which only I will have the password. Results of the study will be reported as group means so no school or individual student score will be traceable.

If you have any questions about this research project please feel free to contact me at, #3 Piccini Site, Belize City, Belize, 501-660-1093, dian.vasquez@okstate.edu or my advisor Dr. Bernita Krumm, 310 Willard Hall, Stillwater, OK 74078, 405-744-9445, bernita.krumm@okstate.edu.

Thanking you in advance and looking forward to a favorable response.

Dian Vasquez, M.Ed, Education Leadership, #3 Piccini Site, Belize City, Belize, 501- 660-1093, dian.vasquez@okstate.edu

Bernita Krumm, Ph.D., Education Leadership, Oklahoma State University, 310 Willard Hall, Stillwater, OK 74078, 405-744-9445, bernita.krumm@okstate.edu

Appendix G

Oklahoma State University Institutional Review Board

Date:	Thursday, February 10, 2011
IRB Application No	ED1119
Proposal Title:	Organizational Climate and Student Achievement in Belizean Secondary Schools
Reviewed and Processed as:	Exempt

Status Recommended by Reviewer(s): Approved Protocol Expires: 2/9/2012

Principal Investigator(s):

Dian Vasquez
#3 PicciniSite
Belize City, Belize,

Bernita Krumm
310 Willard
Stillwater, OK 74078

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

☒ The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Beth McTernan in 219 Cordell North (phone: 405-744-5700, beth.mcternan@okstate.edu).

Sincerely,

Shelia H. Kennison

Shelia Kennison, Chair
Institutional Review Board

Appendix H

Sample Calculation of Mean Exam Score

Original Score Mean	Converted Score	No. of Students	Converted score * No. of Students	Weighted
6	1	0	0	
5	2	11	22	
4	3	38	114	
3	4	60	240	
2	5	21	105	
1	6	6	36	
				3.80

VITA

Dian Vasquez

Candidate for the Degree of

Doctor of Education

Thesis: ORGANIZATIONAL CLIMATE AND STUDENT ACHIEVEMENT IN BELIZEAN SECONDARY SCHOOLS

Major Field: Higher Education

Biographical:

Date of Birth: January 22, 2011

Place of Birth: Belize City, Belize

Education:

Completed the requirements for the Doctor of Education in Higher Education at Oklahoma State University, Stillwater, Oklahoma in December, 2011.

Completed the requirements for the Master of Education in Educational Leadership at University of North Florida, Florida, 2005.

Completed the requirements for the Bachelor of Science in Secondary Education at University College of Belize, Belize, 2005.

Experience:

1992- 2011: Anglican Cathedral College

- Vice Principal, Academics
- Head of Science Department
- Biology, Integrated Science Teacher

2007- 2011: University of Belize, Adjunct Lecturer

- Science Methods for Primary Teachers
- Integrated Science for Primary Teachers

Name: Dian Vasquez Date of Degree: December, 2011

Institution: Oklahoma State University Location: Stillwater, Oklahoma

Title of Study: ORGANIZATIONAL CLIMATE AND STUDENT ACHIEVEMENT IN BELIZEAN SECONDARY SCHOOLS

Pages in Study: 107 Candidate for the Degree of Doctor of Education

Major Field: Higher Education

Scope and Method of Study:

This quantitative study sought to find out if a relationship exists between organizational climate and student achievement in Belizean secondary schools, and explored whether the various factors of school climate have independent effects on achievement. The School Climate Index (SCI), which encompasses the factors of collegial leadership, teacher professionalism, academic press, and community engagement, was used to survey 1226 teachers in Belizean secondary schools. Pearson *r* correlational analysis method was used to determine relationships between the two variables. Further analysis was done using multiple regression technique to find out which of the factors of school climate was the best predictor of academic success in Belizean secondary schools.

Findings and Conclusions:

Findings revealed that there was a significant positive relationship between organizational climate and student achievement in math for Belizean secondary schools. Academic press was found to be the most significant predictor of student math achievement in Belizean secondary schools. This study implies that if Belizean educators focus on improving the academic press of their schools through creating a school environment that is serious, orderly, and focused on academics, there could be an improvement in math achievement in Belizean secondary schools.

Recommendations:

Educators should be cognizant of the climate that exists in a school because it does affect academic achievement. Including this construct in school improvement plans could probably lead to improvement in academic achievement in schools.

Educators need to seek ways of creating an environment that is serious, orderly and pushes the students toward academic success. Such an environment is characteristic of a school with high academic press and according to this study, the latter is a significant predictor of student math achievement in Belizean secondary schools.

ADVISER'S APPROVAL: Dr. Bernita L. Krumm