THE IMPACT OF MASTER SCHEDULING MODELS ON STUDENT PERFORMANCE AS IDENTIFIED BY THE ACADEMIC EXCELLENCE INDICATOR SYSTEM (AEIS) DATABASE IN THE HIGH SCHOOLS OF THE SAN ANTONIO INDEPENDENT SCHOOL DISTRICT, SAN ANTONIO, TEXAS

A Record of Study

by

SCOTT EDWIN MORGAN

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF EDUCATION

August 2005

Major Subject: Educational Administration

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Approved by:

Co-Chairs of Committee,	Virginia Collier
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ABSTRACT

The Impact of Master Scheduling Models on Student Performance as Identified by the Academic Excellence Indicator System (AEIS) Database in the High Schools of the San Antonio Independent School District, San Antonio, Texas. (August 2005)

Scott Edwin Morgan, B.S., Angelo State University; M. Ed., Angelo State University

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This study determined the impact of master scheduling models on student performance as reported by the AEIS database in the high schools of the SAISD. General student performance and the Texas Assessment of Knowledge and Skills were the primary measures for comparison. The SAISD made a transition from an A-B block schedule in 2002 to a traditional-seven period model in 2003. Conclusions have been made as to the degree of influence that traditional and block schedules have on student performance.

The population of this study was the eight high schools of the SAISD. All students enrolled on these campuses were included in the data analysis. The population was 14,418 students during the 2002-2003 school year and 13,689 in 2003-2004. Descriptive statistics and analysis of variance (ANOVA) were the measures utilized for the purposes of population comparisons and data review. Based on the findings of this study, the recommendations for practice indicate the following:

1. Attendance ratings did not return statistical significance on a traditional schedule.
2. Advanced Course participation and AP/IB testing results returned statistical significance on a traditional schedule.
3. SAT and ACT did not return statistical significance on a traditional schedule.
4. TAKS Campus Performance did not return statistical significance on a traditional schedule.
5. TAKS Reading/ELA, Mathematics, Science and Social Studies scores returned statistical significance on a traditional schedule.
6. African American, Hispanic and Special Education Performance returned statistical significance in TAKS Science and TAKS Social Studies on a traditional schedule.
7. White Performance returned statistical significance in TAKS Science on a traditional schedule.
8. Economically Disadvantaged Performance returned statistical significance in each area of the TAKS assessment on a traditional schedule.
9. Limited English Proficient Performance returned statistical significance in TAKS Math on a traditional schedule.

DEDICATION

The entire doctoral experience and this cumulating process of authoring a record of study is dedicated to the patience, pride and understanding of my family. Tiffani E. Morgan, my loving wife of ten years, has demanded of me balance and perspective. Balance in time and balance in energy between work, school, family and personal health. It is because of her presence and involvement in every aspect of this doctoral ambition that few preexisting aspects of my life had to be compromised while I studied, researched, reviewed, wrote or attended class over the past three years. She would not allow rigorous academic demands to dominant my thoughts when it was time to be with family. I never lost perspective in this regard nor placed finishing a paper, reading literature or analyzing data above our three children, our relationship together or visiting with family and friends. Thank you, Tiffani, for keeping me both honest and humble, and for your unwavering love and support.

This record of study is further dedicated to my parents, James E. Morgan, Jr. and Diane D. Morgan; an achievement such as this would not have been possible without their perseverance and resolve in raising a challenging child. This record of study is also offered as a humble remembrance of my brother, Brian J. Morgan, who left this world well before I was prepared to see him go. He is a presence in my life, never far from my thoughts and in so many ways my motivation to help where I can, to develop lasting relationships and to support the ambition of peers, friends and family. Thank you, Brian, for being a part of my life.

ACKNOWLEDGEMENTS

While I dedicate this Record of Study to my immediate family for their love and encouragement, it is equally important for me to acknowledge the academic support and professional direction from everyone associated with the Educational and Human Resource Development (EHRD), and each one of my Texas A&M University professors over the past three years. The practitioner-responsive philosophies of this doctoral program are evident in the required structure, course availabilities and residency stipulations. However, it is the people and professors of this university that have made every aspect of my learning experience not only intellectually beneficial but also enjoyable. From the prompt, patient and helpful assistance of the Academic Advisors, Joyce Nelson and Clarice Fulton, to the broad IRB and thesis office expertise of Bill Ashworth, no Aggie has gone unquestioned or been unreceptive to any of my questions or concerns.

With the utmost respect and admiration to every professor that I have had the great privilege to learn from, there are four that demand individual recognition and acknowledgment – my doctoral committee. Dr. Lynn Burlbaw has given me a historical framework from which to truly appreciate the enigma and circumstance of contemporary education. Secondly, through the course of five classes under the direction of Dr. Julian Trevino, I have embraced a genuine appreciation for the ability of this professor to not only teach but also to challenge and even coerce the development of an individual style and ideology. I value much better the leader and educator that I have the characteristics to be because of his guidance.

Dr. Virginia Collier also seemed to understand my philosophical tendencies and the direction that I most needed from the doctoral experience. She would not accept performance or product from me that many others frequently did. I established a revised personal standard for work and writing. Also, I appreciate very much her willingness to assume a co-chairperson role on my doctoral committee despite what seems to be an absence of university policy to support such an arrangement. And finally, I must make very clear my earnest gratitude for both the personal and professional efforts of Dr. Stephen Stark. Over the past thirty years he has worked with students of all sorts at Texas A&M University, hundreds of other doctoral candidates and has provided me with guidance and every necessary tool to fulfill the requirements of this degree. Dr. Stark is an institution in the EHRD and his knowledgeable presence transcends courses, classes and educational content.

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CHAPTER I

INTRODUCTION

With the advent of the public school reform movement in the early nineteen-eighties, schools and their districts were barraged with criticisms and demands for educational change (Cobb, Abate & Baker, 1999). For the purposes of this study, interest in the extension of classroom time beyond the traditional fifty-minute period first appeared in educational literature under the concept of *modular scheduling* or *flexible scheduling* (Polos, 1969; Stewart & Shank, 1971; Wood, 1970). These models were piloted during the open education period (Queen, 2000), but broad scheduling modifications did not occur until *A Nation at Risk* reported in 1983 that a marked deficiency existed in how American schools were preparing our students (National Commission on Excellence in Education, 1983).

Block scheduling, as these approaches are collectively defined in contemporary research (Bottge, Gugerty, Serlin & Moon, 2003), restructures the school day into fewer classes that operate for longer periods of time, typically four ninety minute classes, instead of the traditional seven classes at a length of forty-five minutes (American Federation of Teachers, 1999; Hemphill, 1995). There are two primary varieties of block scheduling used today, the A-B block model and the 4x4 block approach (Gould, 2003). When schools follow the A-B block or *alternate day* model, students take eight classes through the entire year while meeting with only four each day on an alternating rotation

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The style and format of this record of study to follow those set forth by the *Journal of Educational Research.*

(Lewis, Cobb, Winokur, Leech, Viney & White, 2003). As opposed to the other block schedules, the A-B structure is such that students have an entire year to assimilate information (Gerking, 1995). The research literature is sparse on the effects of A-B scheduling on student performance (Lewis et al, 2003).

Extensive debates have occurred at both the school and district levels about the perceived benefits of longer instructional periods (Veal & Schreiber, 1999; Hemphill, 1995). There are fundamental differences between a traditional schedule of six or seven class periods and any format of block scheduling, just as there are unique chasms between the views of their respective defenders (Gould, 2003). Proponents of the block schedule report benefits of increased levels of performance in the areas of skill mastery and critical thinking (Gainey & Brucato, 1999). In addition, less time needs to be allotted for class transitions, school climates are reported to be more relaxed, graduation rates are higher and daily attendance is consistently better (Allen, 2000; American Federation of Teachers, 1999).

Scheduling traditionalists counter with evidence that these longer instructional periods fail to adequately support average attention spans or the retention of general knowledge in core areas (Gould, 2003). It is also important to note that some block schedules may actually reduce instructional time over the course of a school year in a given class and that absences are much more difficult to resolve in terms of missed assignments (American Federation for Teachers, 1999). Most damaging of any argument is the fact that the findings of numerous studies (Cobb et al, 1999; Wild, 1998; North Carolina Department of Public Instruction, 1996; Lockwood, 1995; Bateson, 1990) conclude no significant differences in student performance with regard to the master scheduling model that their respective schools operate (Veal & Schreiber, 1999).

Even with documented contention, block scheduling continues to be one of the most intriguing mediums for school reform in this country (American Federation of Teachers, 1999). An estimated forty to fifty percent of secondary schools across America have opted to change their master scheduling model to one that allows for longer class periods (American Federation of Teachers, 1999; Canady & Rettig, 1995; Cawelti, 1994). It continues to gain momentum as a viable scheduling improvement initiative largely in response to the literature on cognition that supports deeper learning by students through sustained interactions with their subject matter (Cobb et al, 1999). However, the proponents of the block schedule are very clear about the essential need for planning time to prioritize, realign and re-pace curriculum (Jenkins, Queen & Algozzine, 2002). In essence, the success of block scheduling depends greatly on the professionals who implement it (Queen, 2000) and the context or venue in which it is delivered (Lewis et al, 2003; Cobb et al, 1999). It is unwise to then herald one master scheduling model in favor of another independent of other effectual variables (Veal & Schreiber, 1999). A well-designed schedule, regardless of the model or format that is followed, will be the catalyst for critical change that is needed in high schools across America (Canady & Rettig, 1995).

Statement of the Problem

The block schedule has been heralded as a promising solution to many of the well documented problems that are present in teaching high school students, but this potential does not come without notable cautions, caveats and challenges (Jenkins, Queen & Algozzine, 2002). It is the actual process of transitioning a campus to any format of schedule, and certain school attributes such as implementation specificity, consistency of instructional practices, leadership and authority, participant stability and the context or environment that these changes occur that will ultimately determine success or failure of a given schedule (Lewis et al, 2003).

The struggles to overcome implementation barriers abound in descriptive research literature both supporting and decrying the merits of block scheduling (Gainey & Brucato, 1999; Canady & Rettig, 1995). However, there is an immense void in the available research literature on this subject with regard to identifying certain best practice ideologies across community and student circumstances, and in making performance comparisons with populations transitioning from a block schedule back to a traditional seven-period model. Cobb (1999) goes further by suggesting that certain master scheduling models may be more conducive to the learning styles, life experiences and abilities of certain subgroup enrollments such as economically disadvantaged students (Kenney, 2003). Understanding all of these interdependent dynamics, and then utilizing the master schedule as a genuine resource can have a tremendous impact on the instructional climate of a school and ultimately on student performance (Rettig & Canady, 1999).

Purpose of the Study

The purpose of this study was to determine the impact of master scheduling models on student performance as reported by the Academic Excellence Indicator System (AEIS) database in the high schools of the San Antonio Independent School District (SAISD). These eight schools have each made a transition from an A-B block schedule in 2002-2003 to a traditional-seven period model in 2003-2004. Conclusions have been made as to the degree of influence that traditional and block schedules have on the student performance for both whole populations and various definable subgroups.

Each of the eight high schools of the San Antonio Independent School District has large subgroup populations of Special Education, Economically Disadvantaged and Limited English Proficient students. These respective enrollments can be further identified as having diverse racial composition – African American, Hispanic and White. Specific attention has been given to the evaluation of student performance in these definable subgroup populations. The data analyses of student performance in these high schools offer insight into whether one master scheduling model should be favored over another in the high schools of the San Antonio Independent School District.

Research Questions

This study has been guided by the following research questions:

1. Does a transition from a block scheduling model to a traditional scheduling model impact student performance as identified by the Academic Excellence Indicator System (AEIS) database in the high schools of the San Antonio Independent School District?

2. Does a transition from a block scheduling model to a traditional scheduling model impact student performance in core academic areas as identified by the Academic Excellence Indicator System (AEIS) database in the high schools of the San Antonio Independent School District?

3. Does a transition from a block scheduling model to a traditional scheduling model impact the performance of subgroup student populations as identified by the Academic Excellence Indicator System (AEIS) database in the high schools of the San Antonio Independent School District?

Operational Definitions

The findings of this study have been reviewed within the context of the following definitions of operational terminology:

A-B Block Schedule: The A-B block schedule structures class meetings to convene every other day, or between 84 and 93 school days of the academic school year. Instructional periods are lengthened to accommodate ninety (90) minute class sessions. Students take eight classes each school year but meet with only four each day.

Academic Excellence Indicator System (AEIS): This statewide system database compiles specific information regarding the broad operations and achievements of all Texas state independent school districts and their respective public campuses. The AEIS database includes quantitative reporting on student performance from the Texas Assessment of Knowledge and Skills (TAKS) and information from the Public Education Information Management System (PEIMS).

Bexar County, Texas: A geographic region defined by the state of Texas that encompasses the greater San Antonio area and shares borders with seven other state identified counties.

Campus Comparison Group: This disaggregated database groups campuses from across the state of Texas with similar characteristics that include enrollment percentages of students that can be identified as either economically disadvantaged, Hispanic, African American or White. In addition, mobility ratings and percentages of limited English proficient (LEP) students are used to associate Texas state campuses together for comparative and performance analysis purposes.

Core academic areas: Specific attention will be given to the student performance of both whole populations and certain sub-populations in the academic areas of English Language Arts, reading, mathematics, science and social studies.

Economically Disadvantaged: A student can be identified as economically disadvantaged by an independent school district if they are eligible for free or reducedprice lunch, meet requirements for Title II of the Job Training Partnership Act (JTPA), receive food stamp benefits or qualify for other public assistance. In addition, if the student is under the parental or custodial care of a family with an annual income at or below the official federal poverty regardless of public assistance, they too can be identified as economically disadvantaged.

Impact: To force the impression of one thing on another; or having a significant or major effect on something other than itself.

Master Scheduling Models: Two (2) varieties of master scheduling models will be under review through the course of this study. They are respectively defined as a traditional-seven period schedule and an A-B block schedule. The traditional-seven period schedule structures class meetings to meet each day of the academic year while school is in session. Under this model, individual courses hold instructional periods of forty-five (45) minutes each day. In contrast, the A-B block schedule structures class meetings to convene every other day, or between 84 and 93 school days of the academic school year. Instructional periods are lengthened to accommodate ninety (90) minute class sessions.

Public Education Information Management System (PEIMS): A statewide data management system for public education information in the State of Texas. For the purposes of this study, the major categories of data reported by the PEIMS report include student demographic and program participation data, student attendance, course completion data, retention, graduation rates and dropouts information.

San Antonio Independent School District (SAISD): The SAISD has the second largest student population of the 15 school districts that are entirely or primarily within Bexar

County. It is the ninth largest school district in Texas with a student population of approximately 58,000 students. The SAISD encompasses 79 square miles in central Bexar County and has a total population of 313,436 (1990 U.S. Census). Most of the District is within the city limits of San Antonio, but it also serves parts of the cities of Olmos Park and Balcones Heights and some unincorporated areas of the county.

Selected Economically Disadvantaged High Schools: All eight (8) high schools of the San Antonio Independent School District (SAISD) have been identified by the Texas Education Agency (TEA) and Academic Excellence Indicator System (AEIS) reports for the purposes of this study. These campuses have been recognized by TEA and the AEIS report as serving economically disadvantaged populations of eighty percent (80%) or more. These high school campuses are identified as the following: Brackenridge, Burbank, Edison, Fox Tech, Highlands, Sam Houston, Jefferson and Lanier.

Student Performance: Campus, grade level and subgroup population data as reported by the Texas Education Agency (TEA) annual administration of the Texas Assessment of Knowledge and Skills (TAKS).

Subgroup student populations: Each of the eight high schools of the San Antonio Independent School District are identified by the Academic Excellence Indicator System (AEIS) as having an economically disadvantaged student population of eighty percent (80%) or higher. In addition, distinctions will be made between the student performance measurements of the racial sub-groups Hispanic, African American & White. Specific attention will be given to the performance of both the economically disadvantaged populations and the racial subgroups at these respective high schools.

Texas Assessment of Knowledge and Skills (TAKS): A completely revised standardized testing program implemented during the academic year of 2002-2003 across all public campuses in the State of Texas. The Texas Assessment of Knowledge of Skills (TAKS) includes a more advanced alignment with the Texas Essential Knowledge and Skills (TEKS) than any prior assessment format. TAKS has been developed to better reflect good instructional practice and more accurately measure student learning.

Texas Education Agency: The Texas Education Agency (TEA) is comprised of the commissioner of education and agency staff. The TEA and the State Board of Education (SBOE) guide and monitor activities and programs related to public education in Texas. The SBOE consists of 15 elected members representing different regions. One member is appointed chair by the governor. Under the leadership of the commissioner of education, the TEA administers the statewide assessment program, maintains a data collection system on public schools for a variety of purposes and operates research and information programs among numerous other duties. The TEA operational costs are supported by both state and federal funds.

Traditional-Seven Period Schedule: The traditional-seven period schedule structures class meetings to meet each day of the academic year while school is in session. Under this model, individual courses hold instructional periods of forty-five (45) minutes each day. Students are enrolled in seven classes each day.

Assumptions

The findings of this study have been preceded by the following assumptions:

1. The researcher was impartial and objective in the analyses of data.

2. Interpretation of the data collected accurately reflects the intent of the respondents.

3. The methodology proposed and described offers the most logical and appropriate design for this particular research project.

Limitations

The findings of this study are limited by the following:

1. The scope of this study is limited to the information acquired from the literature review and analysis of data from the high schools of the San Antonio Independent School District (SAISD).

2. The scope of this study is limited to the selected high schools in the San Antonio Independent School District (SAISD).

3. The findings of this study may not be generalized to any group other than the selected high schools in the San Antonio Independent School District (SAISD).

Significance of the Study

Future studies related to master scheduling models and student performance must include an evaluation of the influences that that certain student characteristics may have on research outcomes (Rettig & Canady, 1999). The student populations of a high economically disadvantaged community and those from a more affluent area naturally come to school prepared to learn in very different ways. Redistributing the instructional day into longer more flexible blocks of time is one approach that school leaders propose to address some of these readiness and performance related concerns for all students (Bottge, Gugerty, Serlin & Moon, 2004). The marked significance of comparing two master scheduling models among eight campuses with similar programs, services, teacher training regiments and student populations, is its evaluation of how best to structure instructional opportunities according to these respective student characteristics.

The intent of this study was to ultimately contribute both methodological protocol and additional research-based literature to the debate on master scheduling models – traditional versus block. Student performance characteristics as reported by the Academic Excellence Indicator System database can offer insight as to a preferential scheduling model according for these student enrollments in the eight selected high schools of the SAISD. The quantitative reporting and comparative analyses presented during the course of this study have practical implications for these campuses and the master scheduling policies of the San Antonio Independent School District.

Record of Study Contents

This record of study has been divided into five major content chapters. Chapter one (1) contains an introductory section, the statement of the problem, the purpose of the study, research questions, operational definitions, assumptions, limitations and the significance of the study. Chapter two (2) offers a thorough review of all pertinent literature. The methodological protocol followed during the course of this studied is defined in Chapter three (3). This middle chapter includes an examination of the population studied, instrumentation of the study, procedures used and a brief summarization of how the data was analyzed. Chapter four (4) presents the data that was collected during the course of this research and a quantitative analysis. The final content area, chapter five (5), asserts significant comparisons between the historical literature and the contemporary findings of this study on master scheduling. In addition, the researcher has made recommendations for practice and for further study in the last chapter.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

Since the publication of *A Nation at Risk* by the National Educational Commission in 1983, expectations for school reform have been constant and compelling. Critical demands for improvement (Cobb, Abate & Baker, 1999) have included initiatives in the areas of school readiness, school completion, teacher education and professional development, student achievement, safe school environments and parent participation (NECTL, 1994). Whether by federal enterprise (NCEE, 1983; NECTL, 1994; US Department of Education, 2001) or by the volumes of independent literature (Bottge, Gugerty, Serlin & Moon, 2003; Lewis, Cobb, Winokur, Leech, Viney & White, 2003; Jenkins, Queen & Algozzine, 2002; Adkins, 2001; Garza, 2001; American Federation of Teachers, 1999; Cobb, Abate & Baker, 1999; Veal & Schreiber, 1999; North Carolina Department of Public Instruction, 1996; Canady & Rettig, 1995; Cawelti, 1994), the American educational system has been tried, tested and pressed to liberate the competing ideologies of all those vested in its operation and purpose.

A reflective analysis of the educational reform movement over the past two decades allows for a condensed categorization of these change varieties into three major groupings (Murphy, 1990). With deference to other such theories, we can summarily define school transformations as either a macro-level provision, based in performance outcomes or a localized school condition. This *macro-level reform* movement is most noticeably directed by either state or federal government offices, and often includes comparative literature about the function of America in the global marketplace (Cobb, Abate & Baker, 1999). This broad reform subject focuses on evidence of illiteracy, weak achievement rankings among other developed nations and a measurable absence of a skilled workforce (NCEE, 1983). Increased funding allocations coupled with rigorous accountability measures are a reasonably assumed characteristic of the macro-level initiative for school improvement. Master scheduling reform is not a direct characteristic of these types of changes.

The second identifiable categorization of school reform is that of *performance based outcomes*. This second tier in the reverse pyramid of change has educators, legislators and other participants in the review of school efficacy assume a more pragmatic role to improving schools. Acting as a stimulus to addressing localized student achievement, critics report massive evidence that American students are failing in every imaginable way (Berliner & Biddle, 1995). As a result, the restructuring and intensification of curriculum has evolved as a centerpiece to improving our schools (Fullan, 1991). In addition, greater emphasis have been placed on graduation rates, dropout percentages and the performance of every student without regard to race, ethnicity or the presence of a special learning condition (Department of Education, 2001). To date, the outcome of these measures include curriculum alignment efforts, revisions of instructional programming and heightened performance standards in each of the fifty states, the District of Columbia and in Puerto Rico (Darling-Hammond, 2004; Bottge, Gugerty, Serlin & Moon, 2003). Performance based initiatives are a cause but not necessarily a product of master scheduling reform.

The third domain of school reform that Murphy (1990) theorizes incorporates the recommendations and requirements of both the macro-level and performance based initiatives. Improvements under the guise of *school conditions* tend to be extremely localized as it negotiates the actual governance of individual school environments and their organizational or management practices. This area of reform has itself been consumed by master scheduling reform and the use of time in schools over the last decade. Ultimately, the problems and their possibilities for improvement in this realm are as unique and diverse as the schools themselves, the systems that must confront these challenges. Cawelti (1994) defines this process, the restructuring of schools, as involving a premeditated design in the areas of expectation for school and student, revised academic content exposure and more engaging learning experiences for our students. This is the call for better use of instructional time during the school day.

Much of the recent literature relative to these challenges and on high school education in general, has addressed alternative scheduling models; this emphasis frequently overshadows any and all other educational trends or reform initiatives (Hackmann, 2004). Characterized as a *school condition reform*, the master schedule and the use of time in American schools have come under increasing scrutiny (Metzker, 2003). The National Educational Commission (1994) established much of the contemporary groundwork on the use of school time with great clarity when they stated, “the American school schedule must be modified to respond to the great challenges that have reshaped life outside of school”. Moreover, the No Child Left Behind (NCLB) legislation of 2001 predicates the allocation and division of time as the impetus for improved learning in American schools. Canady and Rettig reported in 1995 that the choice and implementation of a master scheduling model, a largely localized reform initiative, will be the catalyst for genuine school improvement. The debate of which schedule has the potential to achieve better performance continues to evolve. From flexible and modular scheduling to the Copernican model, accelerated blocks, alternating A-B schedules and traditional systems, no single scheduling approach has yet to proven be best.

The theoretical basis for this study, *The Impact of Master Scheduling Models on Student Performance as Identified by the Academic Excellence Indicator System (AEIS) Database in the High Schools of the San Antonio Independent School District*, was defined by a thorough review of relevant literature on school scheduling models. Much of the contemporary reasoning, outcomes and characteristics of scheduling in American schools have been addressed. However, it is the quantitative analysis of student performance between the traditional and block schedule, specifically at the high school level, that demands greater attention in both scope and depth of study.

This Record of Study was designed in such as way as to present a comprehensive investigation of pertinent literature, represent a quality data collection process and ultimately make logical determinations about student performance outcomes in an atmosphere of transition and transformation. The second chapter of this study, the review of literature, is partitioned into four areas of interest. First, a general framework is offered with regard to the structural premise of master scheduling reform. It is followed by a greater detail exploration into student achievement matters. This is naturally followed by instructional methodology issues. Attendance, implementation concerns, student demographics and cost effectiveness factors conclude this review of literature chapter pertaining to master schedule reform.

Structure and Premise

Traditions in education are deeply embedded in our national experience; American schools for all intensive purposes have remained unchanged for the better part of the twentieth-century (Queen, 2000). It was only with the recommendations of the National Commission on Excellence in Education (NCEE) and their report *A Nation at Risk* in 1983 that intense educational reforms began to change the landscape of schools and learning. With unwavering specificity this Commission of political representatives and educators posited a weak national school system caused by too little time actually learning academic competencies, making ineffective use of the available instructional day and an overall inability to teach sound study habits to American students. Numerous studies cite the Commission on Excellence (NCEE) as having inspired a vitalization of work in the area of time use in American schools and to have encouraged educators to begin manipulating the school schedule in such a way as to create improvement in all areas of student performance (Adkins, 2001; Garza, 2001; Queen, 2000).

The National Commission on Learning affirmed this study some ten years later with *Prisoners of Time* (NECTL, 1994). “Schools and their academic day”, they stated, “ought to be reengineered to include fewer non-instructional activities and offer a minimum of 5.5 hours for core subject teaching and even more time to meet ever increasing state standards” (Kane, 1994). The No Child Left Behind (NCLB) legislation has supported these recommendations with a parallel determination that efficient use of time and properly constructed schedules are indeed the necessary medium for improved learning in every school across this nation (Metzger, 2003).

Traditional Seven-Period Schedule

Criticisms of an often rigid traditional schedule that consists of seven class periods in a given day exist for a great variety of reasons. A significant concern of this model is that it reinforces the use of teacher-driven lecture and further fragments the instructional day with excessive class changes (Hackmann, 2004; Glasser, 1992). Studies that indicate longer instructional periods are necessary to support deeper learning by students through sustained and uninterrupted interactions with individual subject matter (Cobb & Abate, 1999). Various formats of the block schedule emerged in part as a response to these visions for greater and more effective uses of time (Kruse & Kruse, 1995) and as a direct rebuttal to the traditional seven period schedule.

The most challenging aspect of conducting a literature review under the context of comparing the seven period model to a block schedule is that the forms and structure of the latter are idiosyncratic to the schools that implement them. Like most reforms in public education, the block schedule is painted with a broad brush (Kenney, 2003). The traditional seven-period master schedule generally consists of seven equally divided classes that meet for approximately fifty (50) minutes each day through the entire school year (Veal & Schreiber, 1999; Hemphill, 1995). Length of course may vary if such a class is offered as a half credit and/or outside of core curriculum requirements. A basic configuration of a traditional seven period day is presented in Table 1.

Table 1. Example of student schedule on a traditional seven period day with period, time and scheduled class arrangement.

TRADITIONAL			
First Period	8:40 AM	9:30 AM	Math
Second Period	9:35 AM	10:25 AM	English
Third Period	10:30 AM	11:20 AM	Foreign Language or Elective
Fourth Period	11:25 AM	12:15 PM	PE/Athletics or Elective
Lunch	**12:20 AM**	**1:10 PM**	
Fifth Period	1:15 PM	2:05 PM	Social Studies
Sixth Period	2:10 PM	3:00 PM	Science
Seventh Period	3:05 PM	3:55 PM	Fine Arts or Elective

During the period of a continuous four-year enrollment at a given high school on a traditional schedule, students under most normal conditions will have the opportunity to achieve twenty-eight (28) credits toward graduation. The maximum constraint for coursework completion however, does not include the circumstance of programs such as Athletics and Fine Arts where students commonly cannot receive credit after their second year of involvement (Texas Education Agency, 1999). In addition, Cawelti (1994) has determined that the rigidity of a traditional schedule often makes precious few allowances for students who may fail a class or for those transferring from schools with various other credit or scheduling structures. Studies on this subject indicate that four-year completion ratings and student drop-out percentages are negatively affected at schools that operate traditional schedules (Carroll, 1990). Second chance opportunities and remedial allowances within the four-year calendar of a high school program must be a characteristic of contemporary education.

Other concerns about traditional scheduling structures include the legislative outcomes of both macro-level and performance based reforms (Murphy, 1990). Many states have attempted to mandate improvements in academic achievement by increasing credit standards required for graduation (Lindsay, 2004). For example, in 1998 Texas transitioned from a twenty-two (22) credit system to that of twenty-four (Texas Education Agency, 2003). Even more dramatically, Georgia has recently abandoned a twenty-one (21) credit configuration in favor of twenty-four (Georgia Department of Education, 1998). These reforms require additional credits and simply more classes while a traditional seven period schedule does not fluctuate in the opportunities to take such classes. In addition, the traditional schedule has limited elective class offerings at some schools while others find it necessary to abolish valuable programs such as music, vocational training and even certain sports (Lindsay, 2004).

The seven period master schedule, its relative inflexibility and a normal ceiling allowance of 28 credits is not, by simple structure, conducive to the rising graduation standards being set by state legislatures across this nation. Nor does is alleviate the mounting criticism for use of Carnegie Units as the foundation for awarding class credit (Knight, Deleon & Smith, 1999; Carroll, 1994). Collectively, these conditions over the last two decades have precipitated sweeping reforms in the areas of master scheduling and the use of time in American schools. The structural merits of a traditional seven period schedule are however significant enough to warrant further analysis against various formats of the block schedule (Bottge, Gugerty, Serlin & Moon, 2003; Jenkins, Queen & Algozzine, 2002; Adkins, 2001; Garza, 2001; Bateson, 1990; Wronkovich, 1998).

First, cognitive sciences emphasize the importance of longitudinal contact with most academic material for best learning to take place. On the traditional schedule students meet 180 consecutive school days versus an every other day arrangement over the same time period (A-B block) or for only ninety days (4x4 block) (Cobb & Abate, 1999). In addition, ninety minutes under any block scheduling condition is a very long period of time to maintain student engagement and interest. This becomes most notable when proper training and professional development initiatives are not in place both during and after transitions are made to a block schedule. (Gainey & Brucato, 1999). Attendance issues also become a noticeable concern on any other schedule system than that of a traditional. Missing a single ninety minute block class, for example, that meets every other day can be equivalent to missing an entire week on a traditional schedule (Carroll, 1990). And, what seems to be the recurring argument for most traditional schedule advocates, the block schedule actually forces a reduction in the instructional time for core curriculum (American Teachers Federation, 1999). One hundred minutes or more is lost over a two week period when contrasting the seat time allocations of traditional and block schedules.

Alternating A-B Block Schedule

The A-B block scheduling model, under the appropriate conditions, can be an effective strategy to counter the challenges of contemporary education while maintaining the benefits of traditional seven period models (Mowen & Mowen, 2004; Lindsay, 2004; Canady & Rettig, 1995). Veldman (2002) offers caution to practitioners that no perfect schedule exists for every high school. But, the A-B schedule has been accepted as an amicable hybrid of sorts between the traditional schedule and the 4x4 block schedule; it takes the best characteristics of the two approaches into a single scheduling model. The A-B block allows for the longitudinal learning aspect of a traditional model while providing fewer class transitions, additional coursework opportunities and longer time-on-task exposure with extended 90-minute class periods. A basic configuration of an A-B block schedule is presented in Table 2.

Table 2. Example of student schedule on an a-b block schedule with alternating day designation, period, time and scheduled class arrangement.

BLOCK			
	A DAY		
First Period	8:40 AM	10:10 AM	Math
Second Period	10:15 AM	11:45 AM	English
Lunch	**11:50 AM**	**12:30 PM**	**-**
Third Period	12:35 PM	2:05 PM	Foreign Language or Elective
Fourth Period	2:10 PM	3:40 PM	PE/Athletics or Fine Art
	B DAY		
First Period	8:40 AM	10:10 AM	Math or Elective
Second Period	10:15 AM	11:45 AM	Science
Lunch	**11:50 AM**	**12:30 PM**	**-**
Third Period	12:35 PM	2:05 PM	Social Studies
Fourth Period	2:10 PM	3:40 PM	PE/Athletics or Fine Art

With A-B block scheduling, a student will take four ninety minute classes on alternating days for the entire school year (Lewis, Cobb & Winokur, 2003). Students have a maximum opportunity to obtain thirty-two (32) credits toward graduation during a continuous four-year enrollment. In many A-B block scheduling systems, however, a policy that is widely identifiable as *double-blocking* occurs with Athletics, most Fine Arts areas (band, choir and orchestra) and some critical core content classes such as Algebra I (Lindsay, 2004). This essentially creates a maximum credit potential of twenty-six to twenty-eight depending upon the number of times that a student can obtain legitimate credit for the same course over a four-year period. State and local policies differ significantly in this regard, and are a source of great contention when evaluating resource allocations and scheduling flexibility.

A high school based study conducted by Deuel (1999) compared block scheduling and the seven-period traditional model in Broward County, Florida – the fifth largest school district in the nation with over 200,000 students. One of the interesting outcomes of this research was that students not only had greater opportunities to enroll in necessary coursework to graduate on time but they were also able to pursue elective classes that interested them. The qualitative review indicated increased accommodations during a four year enrollment for remediation, chances to repeat prior failed coursework and to specialize in certain areas as a foundation for life after graduation. Advance placement participation was significantly higher and dual enrollment in high school and college level classes increased. Block scheduling not only offers larger numbers of course offerings for students (Queen, Algozzine & Eaddy, 1997), but also has the potential to keep four-year completion and graduation ratings legitimately higher (Canady & Rettig, 1993; Edwards, 1995).

The perceived and hypothesized advantages of a block scheduling system are many and seemingly laced with significant potential (Francka & Lindsay, 1995). An A-B scheduling system not only provides extended instructional time each class period, but it also allows for a greater variety of courses over the high school process and a broader preparatory experience altogether. It has been proven however, like all educational reforms, to come burdened with negative consequences and certain other structural aspects that must be carefully considered. Czaja and McGee (1995) offer three such possibilities. First, absences from any one single class can have a tremendous impact on student performance. The block schedule has also experienced tremendous obstacles with regard to teacher readiness to instruct on such a system. These longer periods provide allocations for in-depth study, but too often have been left for instructional practices that are more suited to traditional scheduling models along with otherwise poor management transitions. Finally, student movement and school transfer issues have been cause for great concern.

The trend over the most recent decade, regardless of any concern that may exist, has been for schools to embrace block scheduling. In 1994 Cawelti determined through a national study that more than forty percent of all schools in America were using some form of block scheduling. Other national estimates have the use of block scheduling increasing from 4% to 40% between 1992 and 1995 (TEA, 1999). Canady and Rettig (1995) contended that fifty percent of all high schools in the United States were currently using a scheduling model other than that of a traditional system. And, by 1996 the North Carolina Department of Public Instruction reported that 74% of their secondary schools had converted to a block scheduling model. Queen and Isenhour predicted in 1998 that this 75% marker would be surpassed as a national measure of block schedule implementation.

Despite the popularity of block scheduling, research findings are mixed and offer no definitive advantage for it over that of a traditional seven period model (Bottge, Gugerty, Serlin & Moon, 2003; Payne & Jordan, 1996). For example, some studies have returned positive comparisons for block scheduling (Evans, Tokarczyk, Rice & McCray, 2002; Lare, Jablonski & Salvaterra, 2002; Rettig & Canady, 2001) while in contrast others report no difference or that block scheduling poses a negative impact (Garza, 2001; Gruber & Onwuegbuzie, 2001; Lawrence & McPherson, 2000; Deuel, 1999). Another body of research will document an assortment of diverse or mixed findings within its own pages (Arnold, 2002; Adkins, 2001; Veal & Schreiber, 1999; Hess, Wronkovich & Robinson, 1999). These varied circumstances lend themselves to the increasing demand for practical evidence about student achievement and other indications of scheduling effectiveness and efficiency.

Academic Achievement

The current argument between those who support either a block or traditional schedule is not whether more classes can be offered or which system supports the cognitive theory of deeper and more meaningful learning. School practitioners want to discuss, and ultimately to make decisions based only on the measurable data that could indicate the positive achievement impact of these scheduling models (Gruber & Onwuegbuzie, 2001). Interestingly enough Queen (2000) contends that block scheduling itself was not necessarily designed to conquer the national concerns about achievement. It nonetheless has recently become the focus of national research initiatives. Studies have now intensified their examination of certain student achievement measures such as standardized tests, end-of-course tests (EOC), course grades, grade point averages and college entrance examinations (Wilson & Stokes, 1999). As a result there is evidence in the existing literature that champions block scheduling, while others offer the traditional model as more favorable. There is still more research that has found benefits of both strategies.

Positive Findings for Block Scheduling

Published in 2002, Evans et al. undertook a study to address the concern about achievement outcomes in three New Jersey districts that each respectively transitioned their schools to a block scheduling format. The compiled data summarily indicated a positive return when comparing academic achievement areas. Honor roll achievement – grades of an 80 average or higher – increased from 22 percent to 31 percent on the block schedule and students experience a failing grade dropped to five percent despite the increased in number of courses being taken. In addition, thirty-nine more Advanced Placement (AP) classes were offered across these three school districts with twenty-five percent more students actually passing the AP tests. Standardized testing measures also increased. The average combined score of the Scholastic Aptitude Test (SAT) improved by 14 points and the percentage of 11^{th} grade students meeting state standards in all three core areas went from 67 percent to seventy-three. Block scheduling was an effective reform strategy that improved performance at these schools.

Lare et al. (2002) concluded to similar findings in their research. In the aggregate data, a significantly higher population of students met both 'A' and 'B' honor roll standards. Failing grades also experienced a moderate decline that would indicate greater levels of success even from the average ability student. The most intriguing findings of this study occurred on the Pre-Scholastic Aptitude Test (PSAT). A marked improvement occurred in the mean verbal score during the same year in which the block schedule was implemented. These higher achievement levels of twenty percent or more have been maintained in each subsequent year. Unlike the Evans et al study however, comparisons of AP assessment and college entrance exams such as the American College Test (ACT) and SAT, experienced only a slight positive change, but stayed constant during the period of this study.

Rettig and Canady (2001) continue to challenge any research that may offer less than stellar results for the block schedule. The preponderance of the research they offer, both anecdotal and empirical, is generally positive in favor of a block format. Honor roll populations increase as reflected in grade point averages, and failure rates are consistently lower in light of heavier class schedules – up to three additional academic classes. Much of their research also indicates improved graduation rates and lower drop-out percentages.

They unequivocally state that block scheduling will not have a negative effect on student performance, but caveat the use of block formats as dependent on other factors surrounding its application. It by definition will not necessarily improve student performance. Additional bodies of research are more definitive in their concern about block scheduling and academic achievement.

Mixed Findings for Block Scheduling

Arnold, in 2002, sought out to examine both traditional and block scheduling models at every public secondary school in Virginia. The available data allowed for an analysis of 51 schools operating a traditional schedule and 104 having transitioned to a block schedule. The return of information indicated a general increase in student achievement during the implementation year but diminishing results thereafter. Summarily, Arnold did not experience an evaluation with any significant results when evaluating those schools that had made a decision to change schedules in the past three years. In addition, direct comparisons between the two school groups – traditional and block – without considering recent changes to their scheduling approach, also returned no significant information to favor one model over another.

Another mixed result study on the impact of block scheduling and student performance was reported by Hess et al. in 1999. Initial data analysis in 1997 indicated serious doubt amongst the research team, and the practitioners who commissioned the study, about the efficacy of block scheduling and its ability to specifically improve standardized test scores in mathematics. A second examination was designed in such a way as to broaden the scope of population and curriculum areas. Gender and ability differences were included as control variables for a study group of 270 high school sophomores in the areas of English, biology, geometry and world history. Enrollment in either a traditional or block schedule was done based on student preference to pursue certain subjects. These respective students worked through the exact same coursework and were tested during the first four weeks of school and again in the last month. It was concluded in the larger second study that no difference of statistical significance occurred in geometry or world history. However, in both English and biology the returned data favored the use of a block schedule. Hess et al (1999) concluded that both scheduling models deserve merit.

Deuel (1999) encountered similar disparities when conducting a twenty-three school study of 49,829 students in Broward County, Florida. Traditional and block schedules were contrasted on several measures of student performance. This research could offer no group differences on the percentages of passing grades in either mathematics or science, but the block schedule did return fewer failing grades overall and more grades above ninety percent. Two standardized assessments were also administered to these students. There was no achievement differences reported when comparing students enrolled in either a traditional or block scheduled high school. Drummond (2001) in another study also found no significant difference between the two scheduling models with regard to content areas or student subpopulations. Deuel (1999) contends that more time may be necessary to document any significant variation in academic achievement.

But, a growing body of research questions whether a gathering of data will ever exist to offer unmitigated support for the block schedule over that of a traditional system.

Negative Findings for Block Scheduling

In their 2001 study, Gruber and Onwuegbuzie analyzed comparable student populations that were divided evenly among traditional and block scheduled schools. The focused intent of their research was to evaluate achievement while using schedule type as the primary variable. Grade point averages and test scores on the Georgia High School Graduation Test (GHSGT) were contrasted to provide empirical information and evidence for a favorable model. Results of this investigation indicate that block scheduling does not have a positive effect on academic achievement among high school students. No statistically significant return could be recorded for grade point averages or the writing portion of the GHSGT. However, these standardized test results showed measurable favor to the traditional schedule on the language arts subscale and on the mathematics, social studies and science portion. This study provides evidence that block scheduling can have a negative effect on academic achievement.

Complimentary research to that of Gruber and Onwuegbuzie was completed by Garza (2001) during this same year. This study included 177 secondary campuses representing sixty-seven school districts across the State of Texas. Eighty-one schools operated an alternate block schedule while ninety-six maintained a traditional system. This study returned substantial cause for practitioners to be cautious when considering a transition to block scheduling, and also for those schools debating a continuation of the practice. The analysis consistently revealed achievement deficiencies in the areas of reading, writing and mathematics for those schools on a block schedule. Garza (2001) determined that a traditional schedule in these schools was collectively of greater benefit to academic achievement than any form of a block model.

Lawrence and McPherson (2000) suggest comparable conclusions as a product of their study to evaluate academic achievement differences between the traditional and block schedules. Students of the same school district in southeastern North Carolina, with equal sample sizes on each schedule, were administered four end-of-course (EOC) examinations that included Algebra I, Biology, English I and United States History. The findings concluded that students on the traditional schedule scored significantly higher on each of these respective assessments than those students attending a block scheduled school. The assertion as a result of this empirical information is that block scheduling does not meet all the theorized outcomes that have led many schools to its use and application.

The inconsistency from one study to another has left school decision makers with little or no clear direction as to which scheduling model will benefit student achievement most (Viadero, 2001). To be certain, the student population, overall school environment, scheduling implementation and curricular approach each have a respective influence on the collective success or failure of a school. Although generally supporters of the block scheduling movement, Canady & Rettig (1995) acknowledge that all schedules will have problems, and certain issues will need to be resolved at every school prior to or during the implementation phase. In addition, principals and teachers may be limiting the effectiveness of certain schedules. Queen (2000) contends that many educators have a restricted understanding about the science of master scheduling and/or lack the necessary skills to evaluate appropriate instructional practices with regard to schedule choice. Curriculum and instructional strategies have a marketed impact on master scheduling reform.

Instructional Methodology

Although there is no definitive answer to those who continue to debate the advantages of one master scheduling model over another, it is imperative to appreciate that schedules themselves are simply a tool to assist implementation of curriculum and instruction improvement (American Federation of Teachers, 1999). Furthermore, positive achievement outcomes do not occur by merely making a transition in name only to either a block schedule, back to a traditional model or even pursuing the status quo (Zhang, 2001). Block scheduling, for example, makes significant and fundamental changes to the manner in which teachers prepare teaching materials and in the way that curriculum is made available to students (Wronkovich, 1998). Instructional styles and the use of time in school schedules must support one another if student performance is to improve with scheduling reform (Thomas, 2001). With greater clarity than that which can be found in the available literature on academic achievement, research has emerged with a broad continuity about the instructional formats that are necessary to support the restructuring of traditional schedules.

Traditional Methodology

Results of a 1996 survey conducted by the North Carolina Department of Public Schools indicate that conventional teaching methods were most prevalent regardless of the scheduling method used by the respective school. Instructional strategies such as lecture, teacher-led discussions, independent student practice and assessment modes that included paper and pencil tests were reported equally in both types of schedules. This study showed little or no difference in student achievement between the traditional and block schedule. Rettig and Canady (2003) assert that the success of a block schedule is dependent upon the ability of each teacher to adapt their instruction to longer periods of time. The same approaches to teaching and learning that are commonplace and largely effective in a seven-period system have not proven to fit the ninety minute class. This North Carolina study emphasizes that teachers must in-turn be afforded professional development opportunities on how to apply pacing guides, given time to visit other campuses currently on block schedules, attend time management seminars and engage in content oriented planning. These initiatives based in pedagogy and teaching methodology should also be coordinated to support the overall goals of block scheduling.

Canady and Rettig (1995) found that teachers challenged with longer instructional periods were significantly limited in their effectiveness when using conventional modes of instruction. Material retention and classroom management become a legitimate concern when strategies that are better suited to the traditional classroom are applied to block arrangements. Students do not learn if they are not engaged in the lesson activity and subsequently can become disruptive to others once they become disinterested in learning.

The traditional model of teacher driven lecture in the American classroom must be replaced by differentiated and diverse lessons when on the block schedule so as to better engage student interest (Marshak, 1998). Over reliance on lecture and other traditional modes of teaching is the single-most destructive aspect to the true value of block scheduling (Queen, 2000). The conventional forty-five minute lesson may cover the curriculum, but it does not take full advantage of the ninety minutes that could be used to address various learning styles or allow for the application and extension of knowledge (Jenkins, Queen & Algozzine, 2002; O'Neil, 1995).

Block Schedule Methodology

Evans et al. (2002) discovered that positive achievement outcomes, after the transition to block scheduling, was due to similar methodology implications across each of their population samples. By varying activities between large group assignments, small group activities and individual projects, teachers in this study were able to arrange the majority of each lesson around work other than teacher-oriented lecture. Furthermore, extended time blocks in the three New Jersey school districts that participated, allowed teachers to do more activities altogether while expanding on each class lesson. Students were able to engage with information in a great variety of ways and then present their findings to classmates in the same day. In general, teachers reported the block schedule as being more conducive to working with students according to their individual learning style, greater knowledge of the student, the ability to introduce more material, and the perception that their own teaching was more interesting and challenging. Cawelti (1994) agrees that a greater amount of educational activities can be used when educators are afforded flexible, blocked type schedules.

Although the Deuel study of 1999 returned mixed achievement results after the block scheduling transition, teachers and administrators nonetheless report that great pedagogical advantages can be found with the use of longer instructional periods. No less than ninety-three percent of all teachers surveyed describe an increase in the implementation of entirely new lesson strategies while eighty-six percent report using different practices more often. Other studies have shown that the use of different teaching strategies, after practice and professional development, effectively double in number on the block when compared to a traditional schedule (Munroe, 1989). Approximately seventy percent of the teachers in the Deuel study respectively indicated that instruction was less fragmented, more individualized attention could be given to each student according to their unique learning needs and that creative forms of assessment could be used with greater frequency with blocked class periods. Block scheduling has the potential to liberate innovative teaching methods such as manipulative projects, extensive topic research and cooperative grouping (Ulrich & Yeaman, 1999).

To further substantiate the potential of block scheduling for greater diversity in instructional planning, Payne & Jordan (1996) found overwhelming anecdotal support for longer class periods despite only modest achievement gains. The number of teaching strategies in this study reportedly increased by eighty-one percent and the tendency to be more creative when designing lesson plans rose by seventy-seven percent. There was also revealing data about improved job satisfaction and heightened professional enthusiasm from those teachers currently on a block schedule. Payne and Jordan (1996) finalized their evaluation of instructional implications for longer periods with the reporting of certain teaching formats. In particular, the respective faculties involved in this study believed that the success of block scheduling depended heavily on the incorporation of critical thinking skills into extended assignments, that higher order concepts must be developed through in-depth study, teaching practices must be effectively varied and that curriculum overall must be aligned and integrated. Block scheduling supports these types of instructional formatting (Matarazzo, 1999)

Methodology by Academic Content Area

An intriguing qualitative study done by Hulce in 2000 on the perceptions of high school teachers in Wisconsin produced mixed determinations about instruction on a block schedule. Clear distinctions were made according to academic specialties in the review of information collected. English teachers described teaching advantages to longer periods such as more in-depth learning and extended opportunities to engage in cross-curriculum projects. In addition, compacting curriculum was more prevalent and discussions could be had after longer sustained reading activities. Mathematics teachers indicated great success with more time to complete projects, labs and more involved lessons all during the same class period. Opportunities for discovery methods, material application and more frequent synthesis also forced students to be active learners on a block schedule. Block scheduling does have an affect on mathematics instruction in the areas of curriculum, instruction and assessment (Varrati, 2002).

Richelson (2003) found that a block schedule supports the tenets of an enriched Science classroom as well. The conclusions of these content area teachers, similar to that of mathematics instructors, were an ability to develop lessons that could accomplish lecture, demonstration, labs and group activities with summary and conclusions being reached before each period ended. Hulce (1999) reported the advantage of block scheduling in Social Studies as the instructional prospect of developing higher order and critical thinking strategies. Positive achievement outcomes in these studies, and others (Zychowski, 2002; Brugin-Hartshorn, 2001) were being produced by how teachers designed instruction around larger blocks of time, not necessarily because they worked in a school were a block schedule had been implemented.

A comprehensive report by Jenkins et al (2002) involving over two thousand teachers, added to research literature that suggests a substantial adjustment to instruction must occur when entertaining a transition to block scheduling. This research analyzed the implementation and appropriateness of eleven teaching strategies being used in both varieties of scheduling formats. The block schedule schools returned modest increases in their tendencies to use cooperative learning, small groups, discovery learning, simulation and audiovisual experiences. The use of peer coaching or tutoring experienced significant proliferation on the block schedule. Teaching strategies more common to traditional scheduling were technology applications, various project assignments, Socratic seminars and integrated or thematic lessons. Subsequent analysis proved that these strategies, regardless of scheduling format, were respectively appropriate to their period lengths. A significant disparity was present however in the measurement of project assignments and

Socratic seminar use. The data indicated that block scheduled teachers have experienced greater appropriateness for these techniques than that which was report by their traditional scheduled peers. Jenkins et al. (2002) have summarily determined in this study that these eleven strategies are equally represented in terms of use and frequency by teachers on both schedules.

The improvement of academic skills and material comprehension can be significant if the teacher is prepared to accept the challenges of alternative scheduling and longer blocks of instructional time (Garza, 2001). But, achievement evidence indicates that many of the best practice teaching strategies such as cooperative grouping, peer coaching and discovery learning are not being implemented effectively by block scheduled schools. Teachers need training and practice to genuinely impact student performance (Georgia Department of Education, 1998). Inference and assumption upon review of achievement research is that teachers are either refusing to adapt their craft to longer periods of instruction or school officials are not providing adequate support to these changes in pedagogy. Furthermore, if these teaching methods can indeed support a greater degree of quality learning (Queen, 2000) than student performance on the block schedule would not continue to be reported as mixed, negligible or having no adverse effect (Arnold, 2002; Lawrence & McPherson, 2000; Cobb & Abate, 1999). As a result of the inconsistencies in student achievement and instructional implementation when evaluating scheduling reform initiatives, many school districts have now identified associative factors that may impact master scheduling reform.

Other Factors

The notion that implementation of either a traditional or block schedule will be the sole determinate of improved student achievement or a more frequent occurrence of quality learning is inappropriate (Kelchner, 2003). Most empirical returns on performance and practice cannot endorse one schedule in favor of the other, thus contemporary literature has forced education leaders to begin evaluating other characteristics that impact achievement and school efficacy. Attendance is a contextual factor that has been significantly related to aggregate student performance (Texas Education Agency, 1999). The model that promotes better attendance will theoretically result in better achievement returns.

A growing body of reflective research also places into question the planning, implementation and maintenance of block scheduling over the past decade (Rettig & Canady, 2003, 2001; Kenney, 2003; Queen, 2000, 1998; Shortt & Thayer, 2000). The argument for block scheduling in this regard can be summarized as educators themselves not being effective in using longer periods of instruction. Another important consideration for scheduling reform is its impact on certain student subpopulations. Efforts have been made to generalize the applicability of block schedules with the learning characteristics and styles of certain subpopulations (Bottge et al, 2003; Spencer-Pugh, 2002; Stirling, 2001; Knapp, 1998). Finally, principals, superintendents, school boards and state legislators are now evaluating the cost effectiveness of block scheduling against negligible performance returns. School districts have begun to establish financial criteria in the analysis of block scheduling (Lare et al, 2002).

Student Attendance

In a 1997 publication, Pisapia and Westfall conducted a study of high school students in Virginia. Various indications for improved student performance and school efficacy were examined, one of which was the impact of block scheduling on attendance. Teachers participating in this study reported that student attendance on a block schedule was vastly improved over that of a traditional model. Data was taken three years after the transition from other scheduling models. Student achievement experienced significant improvement, hence the connection between attendance and achievement proved valid. Cobb & Abate (1999) found similar returns of positive attendance growth following the implementation of a block schedule as did other studies (Cosimano, 2004; Mobus, 2004; Buckman, King & Ryan, 1995; Reid, Hierck & Veregin, 1994).

Skorbareck et al. (1997) however found an argument against the block schedule and its impact on student attendance. When examining high school students in Texas, data could not support the hypothesis that attendance improved after the implementation of a block schedule. Guskey and Kifer (1995) also reported no significant difference in the attendance ratings of traditional and block scheduled schools following an evaluation in Frederick, Maryland. Studies that have effectively controlled for the class number variable – four each day versus seven – negative or equivalent returns for student attendance on the block schedule have been consistent. A Kelchner study in 2003 covering almost 1500 Texas high schools provides a more recent example that block scheduling may indeed have no real value when attempting to improve attendance or student performance.

Implementation and Maintenance Problems

Canady and Rettig (2003) have found consistent evidence that many schools are making mistakes when planning for the implementation of block scheduling. As a result the impact on performance and other criteria established as reasons for the change have been minimal if not harmful to the overall school environment. A reflective analysis of campuses in forty-one states offer six problems that have precipitated an abandonment of block scheduling. It is presumable that these same errors will impact the survival of block scheduling in the future. First, a great percentage of these schools experienced weak leadership or flawed decision-making during the adoption period of a block schedule. An absence of consensus prior to implementation was also a frequent characteristic of a failed block schedule.

Many teachers faced with longer instructional periods report being ill-prepared for such a tremendous change in methodology. Canady and Rettig (2001) posit evidence that a great deal of stress occurs during change sequences and the success of block scheduling is largely dependent on teacher ability to effectively adapt. Canady and Rettig in 2003 go on to indicate that dramatizing the performance benefits of the block schedule has led to divisive disappointment, that many campus administrators have made poor scheduling decisions such as double-blocking some elective courses, and that budgetary concerns have forced many schools away from the block schedule altogether. A final characteristic that has encouraged some schools to reject scheduling reform is the lack of rigorous and formal evaluations. Because block schedule carries with it a great variety of prospects for each individual school and for every student as an independent learner, we must establish an effective manner in which to measure each of them (Canady & Rettig, 2003).

A Shortt and Thayer study in 2000 emphasizes the aspect of leadership as schools implement and maintain block scheduling. The role of a principal must change with the adoption of any reform; the master schedule is no exception. There has been an absence of skill in this regard. Also a consistent review of data must be a feature of these schools, teachers need to be trained accordingly and it is imperative that everyone be held accountable to established performance outcomes. Lonardi (1998) explains the consequences of ignoring these components as *Culture of Complacency*. Without an appreciation of qualitative analyses and summarily refusing to prepare or develop contributing staff, innovations such as block scheduling and other reforms will be seriously obstructed. Furthermore, a poor communication system can lead to sweeping fears about change initiatives and data propaganda about student performance will destroy organizational trust when adopting a block scheduling.

Performance of Student Subpopulations

Although the existing research relative to the performance of student subpopulations is sparse, it is nonetheless important to mention in the context of contemporary school reform and block scheduling. All students must achieve academic proficiency regardless of their individual circumstance (US Department of Education, 2001). Bottge et al. (2004) offers the first available study examining the effects of block scheduling on students with disabilities. Twelve randomly selected schools with a combined population of 640 special education students participated in this research. The summative evaluation indicated that block schedules do not necessarily lead to instructional modifications by special education teachers or academic benefits for these challenged students. This supports other studies on general student populations that have found no significant performance change between traditional and block scheduled schools (Evans et al, 2002; Lare et al, 2002; Rettig & Canady, 2001).

In a 2002 study Spencer-Pugh evaluated the influence of block scheduling on African American students. This research found no significant difference after the implementation of a block schedule. Specifically, the data remained constant in the areas of student drop-outs and in failing grade point averages. Another study on African American students completed by Stirling (2001) found that perceptions and attitudes towards school are not precipitated by the master schedule. However, additional information from the results of this research revealed strong correlations between ethnicity, attendance and the respective schedule of their school. African American students had the lowest attendance on a block schedule versus a traditional model. Secondary findings to this research found that Hispanic students have the lowest overall attendance on a block schedule when compared to other subgroups. Kelchner (2003) reported that no significant difference in performance were present in a study that included an evaluation of African-American, Hispanic, White, Native American, Asian, economically disadvantaged and special education students. Hinson (2000) also found no statistical difference in a study that compared the achievement of Limited English Proficient students in traditional and block scheduled schools.

In contrast and as a subset to the overall data analysis, Garza (2001) experienced damaging returns for the block schedule when compared to a traditional. This included negative outcomes for each subpopulation and in all areas of student performance. Attendance returns were consistently lower and drop-out measures were larger. The population mean average of minority, economically disadvantaged, English as a Second Language (ESL) and special education students were higher on a block schedule than the traditional. Correlation efforts indicate a significant relationship between each of these factors and the type of schedule in operation. Student achievement in reading, writing and mathematics also decreased for these student subpopulations. Block scheduling in this particular study example showed the potential for decreasing student and school performance in every measured domain.

Cost Effectiveness

School districts across the nation are transitioning back to traditional master schedules citing evidence that seven-period models are less expensive to operate. The debate here is no longer a matter of cost effectiveness and whether a higher quality learning experience as a result of longer instructional periods exceeds the value of additional teachers and resources. Canady and Rettig (2003) insist that a block schedule is no more costly than an equivalent traditional schedule. Large and small school districts across the country that are faced with severe fiscal conditions have tended to disagree. School officials have found that in the midst of reviewing the competing research about student performance and best teaching practices, a cost analysis between two scheduling models is the one evaluation that can truly offer a bottom-line result. It has become a matter of principle in that if all things are equal the least expensive master schedule should be implemented thus allowing for school resources to be directed to other areas.

Lare et al. (2002) conducted a cost effectiveness study on a high school campus in the western United States. In this instance, the local school board solicited the research to ascertain whether the block schedule improved student performance and if district resources were being used efficiently. Cost effectiveness was not an initial concern but emerged as a significant factor in determining whether this school system, continued with the current block schedule. Annual expenditures since adoption of the block schedule were higher. However, the implementation and future operation of the block schedule on this campus was seen to be cost effective and is justifiable. A less stressful climate exists, a rich curriculum is being offered to every student, attendance is higher, achievement has improved and teachers have remained active in their commitment to professional development and creative instructional strategies.

Other studies have found evidence to the contrary of the research done by Lare et al. (2002). Garza (2001) for example, reported harmful performance effects in every definable category when evaluating the block schedule, yet operating costs where consistently higher. Although with weak statistical value, instructional and other expenditures were respectively higher. Administrative costs however returned a significant difference with the highest possible confidence between traditional and block scheduling. Pisapia et al. (1995) also found that administrative budgets do tend to be higher in an alternative or block scheduled school. These additional expenses have been the cause of extended debate among opponents of the block schedule. They argue that at very best performance differences are negligible and increased administrative costs are indefensible; these tax monies are better spent in classrooms.

Summary of Literature Review

For schools to effectively address the challenges of contemporary education, insistent efforts must be made to understand the idiosyncratic nature of school reform. Change and improvement can take on a great variety of different characteristics. Accountability, methodology, achievement and evaluation are a few of these critical areas. There are also many levels for which restructuring of schools can take place. At the point of *school condition*, master scheduling reform has dominated the education landscape for improvement reform. Both research and practice has attempted to understand whether block scheduling of any sort will bring about improved student performance and heightened school efficacy. The results themselves are collectively inconclusive, but the message about environmental specificity and educator competencies is becoming much more evident.

The review of literature pertaining to master scheduling reform was focused into four major areas. A structural premise of scheduling reform, achievement comparisons, the implication for instructional methodology and other developing characteristics to research on scheduling, were each respectively discussed in this chapter. Both the traditional seven-period schedule and A-B block schedule can provide benefits to student performance by design. However, with additional credit, remediation and course exploration opportunities, the literature favors the block and its ability to meet the demands of increasing credit and mastery requirements. Student achievement is far less definitive. Few studies have been able to offer unequivocal support for either a traditional or block schedule. Much of the available literature on this topic present mixed returns or findings that describe negligible comparisons. When reviewed collectively, neither of these master scheduling models can be championed in every area and for all purposes over its competitor.

Instructional methodology was also a convoluted and contrary area of review. Although it can be determined that block scheduling offers a classroom arrangement for higher order skill development and critical thinking exercises, numerous studies questioned whether these longer periods are being fully utilized. The literature indicates that ineffective training and weak school leadership may be the reason that the block schedule, with regard to methodology potential, has been incapable of improving student performance in most studies. Research on attendance and the achievement of various student subpopulations also found minimal preference for one schedule in favor of another. But, the concerns of block scheduling implementation, and the overall appropriateness of this reform, has been a pervasive theme in recent literature. This issue places into question once again the quality and competency of the educators who are attempting to negotiate the challenges of a block schedule. And finally, the most recent development in scheduling literature has been the movement to transition schools back to traditional systems. No longer is cost effectiveness an issue for debate; resource allocation and bottom-line economics have found a forum in contemporary education and for all intensive purposes taken its place.

CHAPTER III

METHODOLOGY

This study was designed to determine the degree of impact that master scheduling models have on student performance as identified by the Academic Excellence Indicator System (AEIS) database in the high schools of the San Antonio Independent School District (SAISD). Conclusions have been made as to the degree of influence that traditional and block schedules have on student performance. Both the core academic areas and certain definable student subgroup populations have been studied in addition to the whole enrollments of these campuses and other general performance characteristics. The following questions have guided the research emphasis of this study:

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3. Does a transition from a block scheduling model to a traditional scheduling model impact the performance of subgroup student populations as identified by the Academic

Excellence Indicator System (AEIS) database in the high schools of the San Antonio Independent School District?

Population

San Antonio Independent School District has eight high schools and each was confirmed to be a viable study population by telephone interviews between the researcher and various SAISD administrative staff members. The preliminary populations that had been defined for the purposes of this master scheduling study included multiple other school districts across the State of Texas, including the SAISD. The intriguing circumstance of each of the eight SAISD high schools each transitioning from the block scheduling model back to a traditional system in the same year redefined the population to be studied. Direct and comparable circumstances are present throughout the entire student population to be studied thus ensuring a higher degree of validity in its outcome. In addition, because of an enrollment decline and the need for fewer teachers on a traditional schedule, there were very few changes to the existing 2004 instructional staff when compared to the previous year. These high school campuses are identified as the following: Brackenridge, Burbank, Edison, Fox Tech, Highlands, Sam Houston, Jefferson and Lanier.

The population of this study for the purposes of both school and student performance analysis included the eight high schools of the San Antonio Independent School District. All students enrolled in these high schools were included in the data analysis of performance for this project. These high school campuses in Bexar County, Texas, have been identified by the Texas Education Agency (TEA) as respectively operating with economically disadvantaged student populations of eighty percent (80%) or higher and diverse racial compositions – Hispanic (+85%), African American (+10%) & White (+5%). Performance data from these subgroups, and from Special Education and Limited English Proficient, have been independently analyzed. The participating student populations were 14,418 during the 2002-2003 school year and 13,689 in 2003-2004.

The TAKS associated student performance areas and the Public Education Information Management System (PEIMS) data is publicly reported in whole as a component of the Academic Excellence Indicator System (AEIS) database. This AEIS database has defined the populations to be studied by the enrollment and demographic information forwarded from each school district and their respective campuses. Seventeen areas of data are under examination, each derived from the AEIS database. All students enrolled in these high school campuses are reflected in the performance information from these reports.

Instrumentation

The data collected for the purposes of this study will be derived from the Academic Excellence Indicator System. This AEIS database constitutes two large bodies of information that are identified as the Texas Assessment of Knowledge and Skills and the Public Education Information Management System. The TAKS is a statewide administered assessment of student performance in all academic areas. The PEIMS database reports on student demographics, special program participation data and student attendance. Data collected from the AEIS database included the following categories:

1. Student Enrollment and Demographics
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15. Special Education Achievement
16. Economically Disadvantaged
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Test reliability measures such as the Kuder-Richardson Formula (KR-20) indicate that the internal consistency of the TAKS test for multiple choice and short answer questions are in the high .80s to low .90s. The validity of the TAKS test, or the degree to which the TAKS offers a genuine evaluation of the state curriculum and student performance, is advertised by the Texas Education Agency as *extremely high*. Multiple committees of Texas State educators have driven an extensive alignment effort between the TEKS and TAKS to ensure effective levels of validity. This level of validity has been measured as effective for all student sub-populations. The PEIMS reporting process is understood to be a direct and accurate reflection of the demographic information from each campus. All data collected was analyzed after programming input by the Statistical Package for the Social Sciences (SPSS).

Procedures

The 2003-2004 edition of the Texas Schools Directory was referenced to identify the contact information for all Bexar County High School campuses. A primitive data recording instrument charted the master scheduling configuration of these schools, the length of time each school had committed to one schedule or another and the student demographic information from these campuses. Brief telephone conversations with various faculty members at these schools assisted in the gathering of this data. Also, the Academic Excellence Indicator System database provided more in depth indicators of student demography and performance. Following the identification process, these data were transferred to an electronic format – Microsoft Excel.

Student performance outcomes of the Texas Assessment of Knowledge and Skills and data reported by the Public Education Information Management System was forwarded to the Texas Education Agency following the respective school and district testing dates in the Spring of 2004. The TEA made this information publicly accessible through their internet based website in January of 2005. The Uniform Resource Locator

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Data Analysis

The examination of student performance at these eight high schools in the San Antonio Independent School District, as reported by the Academic Excellence Indicator System database, was conducted under the accepted quantitative measures that have been identified by Gall, Gall & Borg (2003). Analysis has been performed on the collected data from the AEIS database by the Statistical Package for the Social Sciences (SPSS) – an electronic driven statistical software program.

The performance of all students enrolled in these high schools was analyzed to address the first and second questions of research. Student Attendance, Advanced

Course participation, Advanced Placement and International Baccalaureate scores, SAT mean averages and ACT mean averages were evaluated to answer the first question for research. The Texas Assessment of Knowledge and Skills achievement was utilized for the second. TAKS is compromised of Reading and English Language Arts (ELA), Mathematics, Science and Social Studies. Definable subgroups, for the purposes of answering the third question will include African American, Hispanic, White, Special Education, Economically Disadvantaged and Limited English Proficient students. The descriptive or summary statistics were observation number, mean score standard deviation, standard error of the mean, minimum and maximum observation values. They were employed to define populations to be studied in a concise manner.

To answer each of the three research questions, inferential statistics – analysis of variance (ANOVA) – was used to evaluate or infer the degree of significant difference present when measuring the student performance of a traditional-seven period scheduling model after a transition from an A-B model has taken place in the high schools of the SAISD. The level of significance for testing the hypotheses of this research has been set at .05 or at a 95% confidence level. The following questions have guided the research emphases of this study:

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This study included both descriptive and inferential statistics. The respective data presentations were reported in table format as mean score, standard deviation, standard error of the mean and both minimum and maximum observation values. The Analysis of Variance (ANOVA) included between and within group mean sum of squares, degrees of freedom, the mean square, F-statistic and p-value significance. All analyses, interpretations and recommendations followed the principles that have been identified by Gall, Gall & Borg (2003). The findings set forth by this study are presented in detail and further discussed in Chapter IV: Analysis of Data, in this Record of Study. A summary of the conclusions made by this study are discussed in Chapter V.

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CHAPTER IV

ANALYSIS OF DATA

Introduction

The motivation for this study was to evaluate the impact of master scheduling models on student performance as identified by the Academic Excellence Indicator System (AEIS) Database in the high schools of the San Antonio Independent School District (SAISD) in San Antonio, Texas. Specific attention has been given to whether the decision of employing a traditional schedule of seven periods or that of an alternating A-B block schedule can create a measurable influence on student performance. Chapter four, *Analysis of Data*, presents a quantitative evaluation of student and campus performance over the course of two academic school years, 2002-2003 and 2003-2004, in all eight of the San Antonio Independent School District high schools. Dependent to the format of this study and all other statistical variables, each of these eight campuses transitioned from an alternating A-B block schedule in 2002-2003, to a traditional model of seven instructional periods in 2003-2004.

Data review and analysis occurred in the areas of general student performance, focused examinations of student performance core content (Reading and English Language Arts (ELA), Mathematics, Science and Social Studies) and the further identification of academic performance by subpopulations to include African American, Hispanic, Anglo, Special Education and Limited English Proficient (LEP) students.

Disaggregate information for campus statistics will be included in similar format to that of inclusive data for whole populations of the San Antonio Independent School District. The first defined section of this chapter (4), *Analysis of Data*, presents a descriptive demographic sketch of this school district and each of the respective subgroups that are included in this study. The second and more extensive section of this chapter includes a charted tablature of performance data review and analysis. This section is the quantitative discovery or result from the following questions that have guided this research:

1. Does a transition from a block scheduling model to a traditional scheduling model impact student performance as identified by the Academic Excellence Indicator System (AEIS) database in the high schools of the San Antonio Independent School District?
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Demographic Data

The high school populations of the San Antonio Independent School District (SAISD) were identified to be a viable study by telephone interviews between the researcher and various district administrators. Each of these eight SAISD high schools transitioned from an A-B block scheduling model to that of a traditional system. Direct and comparable circumstances are present throughout the entire population to be studied thus ensuring a high degree of validity in its outcome. These high school campuses and their communities are identified as the following: Brackenridge (001), Burbank (002), Edison (003), Fox Tech (004), Highlands (005), Sam Houston (006), Jefferson (007) and Lanier (008).

The population of this study for the purposes of both school and student performance analysis included all eight of the high schools of the SAISD. All students enrolled in these high schools were included in the data analysis of performance for this research. These high school campuses in Bexar County, Texas, have been identified by the Texas Education Agency as respectively operating with economically disadvantaged student populations of eighty percent (80%) or higher and with diverse racial compositions – Hispanic (+85%), African American (+10%) & White (+5%). Performance data from these subgroups and that from special education, economically disadvantaged and limited English proficient students have been independently analyzed. The participating student populations were 14,418 during the 2002-2003 school year and 13,689 in 2003-2004.

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Table 3. Enrollment data by ethnic groups for the block schedules (2003) and traditional schedules (2004) at the high schools of the SAISD in San Antonio, Texas.

Enrollment		N	Mean Enrollment	Std. Deviation	Std. Mean Error	Min Enroll	Max Enroll
Campus	Block	8	1710.875	325.3075	115.0136	1227.0	2214.0
	Traditional	8	1667.750	342.5325	121.1035	1140.0	2181.0
	Total	16	1689.313	323.4721	80.8680	1140.0	2214.0
African American	Block	8	167.875	257.4637	91.0272	3.0	782.0
	Traditional	8	155.250	239.1238	84.5430	3.0	726.0
	Total	16	161.563	240.1266	60.0317	3.0	782.0
Hispanic	Block	8	1465.750	455.5056	161.0456	405.0	1816.0
	Traditional	8	1442.000	465.4224	164.5517	365.0	1771.0
	Total	16	1453.875	445.0453	111.2613	365.0	1816.0
White	Block	8	72.750	70.4146	24.8953	11.0	234.0
	Traditional	8	66.000	64.0045	22.6290	3.0	210.0
	Total	16	69.375	65.0977	16.2744	3.0	234.0
Special Education	Block	8	255.750	33.8727	11.9758	221.0	311.0
	Traditional	8	258.000	35.0184	12.3809	211.0	314.0
	Total	16	256.875	33.3024	8.3256	211.0	314.0
Economic Dis.	Block	8	1450.375	297.4381	105.1602	986.0	1824.0
	Traditional	8	1382.250	315.3663	111.4988	892.0	1787.0
	Total	16	1416.313	298.2216	74.5554	892.0	1824.0
LEP	Block	8	160.500	51.1441	18.0822	54.0	214.0
	Traditional	8	139.500	54.2428	19.1777	37.0	211.0
	Total	16	150.000	52.0705	13.0176	37.0	214.0

Table 3 reflects summary statistics of a descriptive nature for the student populations of the San Antonio Independent School District during the two academic years relative to this study. The average population mean of the eight SAISD high school campuses in 2003 was 1711 with a standard deviation of 325 students and a standard error mean of 115. Collectively these schools experienced an enrollment decline in 2004 that resulted in an average mean population of 1668. A standard deviation of 342 and a standard error mean that indicates some of these campuses experienced more of a change in student enrollment than others. During the 2003 school year the respective population mean of the economically disadvantaged subgroup was 1450. A slight decrease in 2004 resulted in an enrollment mean of 1382.

The data also describes a population with a comparative majority of Hispanic students – 1466 during the block schedule year and 1442 after the transition to a traditional scheduling model. African American and White students respectively comprise most of the remaining population of the high schools in the SAISD. A very large percentage of all students enrolled on these campuses can also be defined as economically disadvantaged. Limited English Proficient students experienced a practical decline in student population, however, the Special Education mean increased by 2.25 students per campus.

Table 4 analyzes the demographic data of the San Antonio Independent School District with ANOVA (Analysis of Variance) to determine any significant disparities that may exist in the student populations of the SAISD from 2002-2003 to 2003-2004. With a confidence level of .05 an ANOVA assessment determined that a difference of statistical significant did not exist when comparing the student enrollments of the SAISD from the academic years of 2002-2003 and 2003-2004. This holds consistent when examining each of the ethnicity classifications, Special Education, Economically Disadvantaged and Limited English Proficient subgroups. The validity of measuring these student enrollments in the areas of performance and achievement is empirically justifiable. The following section in this chapter offers a presentation of data from the descriptive findings and statistical analysis used to address the guiding questions for research in this study.

Table 4. ANOVA with sum of squares, degrees of freedom, mean square, F-statistic and p-value significance for enrollment between block schedule (2003) and traditional schedule (2004) at the high schools of the San Antonio Independent School District in San Antonio, Texas.

Enrollment		Sum of Squares	df	Mean Square	F	p-value
Campus	Between Groups	7439.063	1	7439.063	.067	.800
	Within Groups	1562074.3	14	111576.741		
	Total	1569513.4	15			
African American	Between Groups	637.563	1	637.563	.010	.920
	Within Groups	864274.37	14	61733.884		
	Total	864911.93	15			
Hispanic	Between Groups	2256.250	1	2256.250	.011	.919
	Within Groups	2968723.5	14	212051.679		
	Total	2970979.7	15			
White	Between Groups	182.250	1	182.250	.040	.844
	Within Groups	63383.500	14	4527.393		
	Total	63565.750	15			
Special Education	Between Groups	20.250	1	20.250	.017	.898
	Within Groups	16615.500	14	1186.821		
	Total	16635.750	15			
Economic Dis.	Between Groups	18564.063	1	18564.063	.198	.663
	Within Groups	1315477.3	14	93962.670		
	Total	1334041.4	15			
LEP	Between Groups	1764.000	1	1764.000	.635	.439
	Within Groups	38906.000	14	2779.000		
	Total	40670.000	15			

$*p<.05$

Analysis of Research Questions

Research Question Number One

Does a transition from a block scheduling model to a traditional scheduling model impact student performance as identified by the Academic Excellence Indicator System (AEIS) database in the high schools of the San Antonio Independent School District?

The intent of this question for research was to determine the difference in student performance between block (2003) and traditional (2004) schedules in the high school campuses of the SAISD. Attendance ratings, Advanced Placement participation, Advanced Placement and International Baccalaureate results, SAT mean scores and ACT mean scores were each independently analyzed. The data from these various assessment formats are evaluated as components of the Academic Excellence Indicator System by the Texas Education Agency. Descriptive and ANOVA statistics are presented to describe the degree of impact that block and traditional schedules have on student performance in these areas. ANOVA was applied to data from each campus with an all test analysis and then disaggregated by content area to respectively determine significant difference.

Table 5 presents the number of campuses (N), mean score, the standard deviation and standard mean error for general student performance in the areas of attendance, advanced course participation, advanced placement and international baccalaureate passing percentage, SAT mean average and ACT mean average. Each area was analyzed independently for the school years of 2002-2003 and 2003-2004. The general performance areas of student attendance and AP/IB results experienced a decline in group mean. AC participation, the SAT mean average and ACT mean average all returned higher values while on a traditional schedule. The minimum and maximum observation values are also provided for each campus.

Table 5. Campus number (N), mean score, standard deviation, standard mean error, minimum and maximum scores for general student performance on block schedule (2003) and traditional schedule (2004) at the high schools of the San Antonio Independent School District in San Antonio, Texas.

General Performance		N	Mean Score	Std. Deviation	Std. Mean Error	Min Score	Max Score
Daily Attendance %	Block	8	92.163	.6457	.2283	91.6	93.1
	Traditional	8	91.938	1.5574	.5506	89.0	93.6
	Total	16	92.050	1.1576	.2894	89.0	93.6
AC Participation %	Block	8	17.600	4.9330	1.7441	14.5	29.5
	Traditional	8	36.200	6.3399	2.2415	27.2	42.8
	Total	16	26.900	11.0621	2.7655	14.5	42.8
AP/IB Passing %	Block	8	26.825	6.6586	2.3542	17.8	33.9
	Traditional	8	15.763	11.7539	4.1556	.0	32.1
	Total	16	21.294	10.8534	2.7134	.0	33.9
SAT Mean Avg.	Block	8	796.750	46.3149	16.3748	726.0	876.0
	Traditional	8	808.750	39.8130	14.0760	734.0	869.0
	Total	16	802.750	42.1798	10.5449	726.0	876.0
ACT Mean Avg.	Block	8	16.713	.6424	.2271	15.4	17.7
	Traditional	8	16.888	.7882	.2787	15.6	17.9
	Total	16	16.800	.7005	.1751	15.4	17.9

Table 6 reports the ANOVA assessment for the general performance areas of student attendance, advanced course participation, advanced placement and international baccalaureate scores, SAT mean average and ACT mean average. ANOVA tested this data set at a confidence level of .05. Advanced course participation and the scoring results of the advanced placement and international baccalaureate tests returned a statistically significant difference. Their respective p-values were .001 for participation and .036 for the AP/IB scoring results. The area of instructional costs also returned a value of statistical significance. All other areas of the general performance analysis on the SAISD did not return significance. Collectively their p-value for significance was higher than .05. The sum of squares, degrees of freedom, mean square and F-statistic are also reported for each content area.

Table 6. ANOVA with sum of squares, degrees of freedom, mean square, F-statistic and p-value significance for general student performance with significance between block schedule (2003) and traditional schedule (2004) at the high schools of the San Antonio Independent School District in San Antonio, Texas.

General Performance		Sum of Squares	df	Mean Square	F	p-value
Daily Attendance %	Between Groups	.202	1	.202	.142	.71
	Within Groups	19.897	14	1.421		
	Total	20.100	15			
AC Participation %	Between Groups	1383.840	1	1383.840	42.8	.001*
	Within Groups	451.700	14	32.264		
	Total	1835.540	15			
AP/IB Passing %	Between Groups	489.516	1	489.516	5.36	.03*
	Within Groups	1277.434	14	91.245		
	Total	1766.949	15			
SAT Mean	Between Groups	576.000	1	576.000	.309	.58
	Within Groups	26111.000	14	1865.071		
	Total	26687.000	15			
ACT Mean	Between Groups	.122	1	.122	.237	.63
	Within Groups	7.237	14	.517		
	Total	7.360	15			

***p<.05**

Research Question Number Two

Does a transition from a block scheduling model to a traditional scheduling model impact student performance in core academic areas as identified by the Academic Excellence Indicator System (AEIS) database in the high schools of the San Antonio Independent School District?

The intent of this question for research was to determine the levels of student performance that each of the high school campuses in the SAISD reported on those core subject areas assessed by the Texas Assessment of Knowledge and Skills. Reading and English Language Arts (ELA), Mathematics, Science and Social Studies are the four areas that comprise this standardized achievement test. The data from these assessments are evaluated as the primary component of the Academic Excellence Indicator System by the Texas Education Agency. Descriptive and inferential statistics are presented to describe the degree of impact that block and traditional schedules have on student performance in these areas. ANOVA was applied to data from each campus with an all test analysis and then disaggregated by content area to respectively determine significant difference.

Table 7 contains data for all test TAKS performance that is organized by campus. Each campus experienced a positive change in the mean score of TAKS performance. The number of campuses evaluated in this chart did not vary between the block (2003) and traditional schedules (2004). Standard deviations and standard error of the mean negatively changed at seven high schools of the San Antonio Independent

School District. The minimum and maximum performance values are provided for each campus.

Table 7. Campus number (N), mean score, standard deviation, standard mean error, minimum and maximum scores for TAKS performance on block schedule (2003) and traditional schedule (2004) at the high schools of the San Antonio Independent School District in San Antonio, Texas.

TAKS Performance By Campus		N	Mean Score	Std. Deviation	Std. Mean Error	Min Score	Max Score
Brackenridge	Block	4	66.000	13.3666	6.6833	54.0	82.0
	Traditional	4	72.500	13.7961	6.8981	58.0	90.0
	Total	8	69.250	13.0466	4.6127	54.0	90.0
Burbank	Block	4	52.500	15.7162	7.8581	35.0	69.0
	Traditional	4	68.000	13.9284	6.9642	54.0	84.0
	Total	8	60.250	16.0513	5.6750	35.0	84.0
Edison	Block	4	53.250	16.1941	8.0971	40.0	73.0
	Traditional	4	71.750	13.8173	6.9086	58.0	90.0
	Total	8	62.500	17.0880	6.0415	40.0	90.0
Fox Tech	Block	4	49.750	15.3921	7.6960	35.0	69.0
	Traditional	4	67.000	12.9872	6.4936	57.0	85.0
	Total	8	58.375	16.0885	5.6881	35.0	85.0
Highlands	Block	4	60.500	17.8606	8.9303	43.0	82.0
	Traditional	4	68.250	16.2352	8.1176	53.0	89.0
	Total	8	64.375	16.3352	5.7754	43.0	89.0
Houston	Block	4	48.500	24.3653	12.1826	29.0	82.0
	Traditional	4	58.250	21.6545	10.8272	40.0	89.0
	Total	8	53.375	21.9671	7.7665	29.0	89.0
Jefferson	Block	4	67.250	16.2147	8.1074	47.0	85.0
	Traditional	4	73.000	13.7113	6.8557	62.0	92.0
	Total	8	70.125	14.2371	5.0336	47.0	92.0
Lanier	Block	4	51.500	18.4481	9.2241	33.0	76.0
	Traditional	4	64.500	13.7961	6.8981	53.0	83.0
	Total	8	58.000	16.6046	5.8706	33.0	83.0

Table 8 represents the ANOVA assessment for TAKS performance organized by each campus. As a measure of TAKS performance by campus there was no significant improvement for any of the eight high schools in the San Antonio Independent School

District. These campuses could not individually reject a possible null hypothesis that a mean difference in TAKS achievement would result in a zero value with 95% confidence. The data analysis indicates that student achievement showed positive

Table 8. ANOVA with sum of squares, degrees of freedom, mean square, F-statistic and p-value significance for campus TAKS performance with significance between block schedule (2003) and traditional schedule (2004) at the high schools of the San Antonio Independent School District in San Antonio, Texas.

TAKS Performance By Campus		Sum of Squares	df	Mean Square	F	p-value
Brackenridge	Between Groups	84.500	1	84.500	.458	.524
	Within Groups	1107.000	6	184.500		
	Total	1191.500	7			
Burbank	Between Groups	480.500	1	480.500	2.179	.190
	Within Groups	1323.000	6	220.500		
	Total	1803.500	7			
Edison	Between Groups	684.500	1	684.500	3.021	.133
	Within Groups	1359.500	6	226.583		
	Total	2044.000	7			
Fox Tech	Between Groups	595.125	1	595.125	2.935	.138
	Within Groups	1216.750	6	202.792		
	Total	1811.875	7			
Highlands	Between Groups	120.125	1	120.125	.412	.545
	Within Groups	1747.750	6	291.292		
	Total	1867.875	7			
Houston	Between Groups	190.125	1	190.125	.358	.572
	Within Groups	3187.750	6	531.292		
	Total	3377.875	7			
Jefferson	Between Groups	66.125	1	66.125	.293	.608
	Within Groups	1352.750	6	225.458		
	Total	1418.875	7			
Lanier	Between Groups	338.000	1	338.000	1.274	.302
	Within Groups	1592.000	6	265.333		
	Total	1930.000	7			

$^*p<.05$

change on each campus of the SAISD after implementation of a traditional schedule but the change was not statistically significant.

The sum of squares, degrees of freedom, mean square and F-statistic are also reported for each content area. ANOVA tested this data set at a confidence level of .05.

Table 9 presents the number of campuses (N), mean performance score, the standard deviation and standard mean error for each content area within the Texas Assessment of Knowledge and Skills. The areas of TAKS achievement included Reading ELA, Mathematics, Science and Social Studies. Each of these four core content areas experienced a change in mean score after the transition to a traditional schedule. Observation numbers were consistent for each year tested while standard deviation and the standard error of the mean decreased on each test after the transition back to a traditional master schedule. Reading ELA returned the weakest difference of comparison while Science had the most dramatic increase in 2004. The minimum and maximum observation values are also provided for each content area.

Table 9. Campus number (N), mean score, standard deviation, standard mean error, minimum and maximum scores for core content TAKS performance on block schedule (2003) and traditional schedule (2004) at the high schools of the San Antonio Independent School District in San Antonio, Texas.

Core Content TAKS		N	Mean Score	Std. Deviation	Std. Mean Error	Min Score	Max Score
Reading ELA	Block	8	62.000	8.6023	3.0414	51.0	74.0
	Traditional	8	70.500	6.3471	2.2440	57.0	76.0
	Total	16	66.250	8.5206	2.1301	51.0	76.0
Mathematics	Block	8	45.875	9.8480	3.4818	32.0	63.0
	Traditional	8	55.375	6.7599	2.3900	40.0	62.0
	Total	16	50.625	9.5210	2.3803	32.0	63.0
Science	Block	8	39.500	8.2115	2.9032	29.0	54.0
	Traditional	8	58.000	6.6762	2.3604	47.0	66.0
	Total	16	48.750	11.9805	2.9951	29.0	66.0
Social Studies	Block	8	77.250	6.3640	2.2500	69.0	85.0
	Traditional	8	87.750	3.2842	1.1611	83.0	92.0
	Total	16	82.500	7.3030	1.8257	69.0	92.0

Table 10 reports the ANOVA assessment for the content areas that comprise the Texas Assessment of Knowledge and Skills. A mean score improvement on the 2004 TAKS was returned with statistical significance in Reading ELA, Mathematics, Science and Social Studies. This difference in student achievement was significant at the .05 level for all core content areas. Significance values in mean score ranged from .041 in Reading ELA to .001 in Science and Social Studies. Mathematics experienced p-value of .041 on a traditional schedule. The sum of squares, degrees of freedom, mean square and F-statistic are also reported for each content area. ANOVA tested this data set at a confidence level of .05.

Table 10. ANOVA with sum of squares, degrees of freedom, mean square, F-statistic and p-value significance for core content TAKS performance with significance between block schedule (2003) and traditional schedule (2004) at the high schools of the San Antonio Independent School District in San Antonio, Texas.

Core Content TAKS		Sum of Squares	df	Mean Square	F	p-value
Reading ELA	Between Groups	289.000	1	289.000	5.058	.041*
	Within Groups	800.000	14	57.143		
	Total	1089.000	15			
Mathematics	Between Groups	361.000	1	361.000	5.060	.041*
	Within Groups	998.750	14	71.339		
	Total	1359.750	15			
Science	Between Groups	1369.000	1	1369.00	24.446	.001*
	Within Groups	784.000	14	56.000		
	Total	2153.000	15			
Social Studies	Between Groups	441.000	1	441.000	17.198	.001*
	Within Groups	359.000	14	25.643		
	Total	800.000	15			

$^*p<.05$

Research Question Number Three

Does a transition from a block scheduling model to a traditional scheduling model impact the performance of subgroup student populations as identified by the Academic Excellence Indicator System (AEIS) database in the high schools of the San Antonio Independent School District?

The intent of this question for research was to determine the levels of subgroup student performance that each of the high school campuses in the SAISD reported on the core content areas assessed by the Texas Assessment of Knowledge and Skills. Reading and English Language Arts (ELA), Mathematics, Science and Social Studies are the four areas that comprise this standardized achievement test. The ethnicity subgroup classifications to be presented are African American, Hispanic and White. Students of other races and ethnicities that were enrolled in these high schools did not comprise a population large enough to study independently. The educational service or program subgroups to be studied are Special Education, Economically Disadvantaged and Limited English Proficient.

There were six subgroups in total that commanded independent analysis. The data from each area of TAKS are evaluated as the primary component of the Academic Excellence Indicator System by the Texas Education Agency. Descriptive and inferential statistics are presented to describe the degree of impact that block and traditional schedules have on subgroup student performance in these content areas. ANOVA was applied to the data from each subgroup and disaggregated by content area to respectively determine statistical significant.

Table 11 presents the number of campuses (N), mean score, the standard deviation and standard mean error for the achievement of African American students in the eight high schools of the San Antonio Independent School District. The mean score of this subgroup showed a positive change in each content area of the Texas Assessment of Knowledge and Skills after the transition to a traditional schedule. Six observations or groupings of African American students by campus held constant from 2003 to 2004 with the exception of Reading ELA. Standard deviation and standard error of the mean varied in each content area for this subgroup in 2004. The minimum and maximum observation values are also provided for each content area.

Table 11. Campus number (N), mean score, standard deviation, standard mean error, minimum and maximum observation totals for African American performance on block schedule (2003) and traditional schedule (2004) at the high schools of the San Antonio Independent School District in San Antonio, Texas.

African American		N	Mean Score	Std. Deviation	Std. Mean Error	Min Score	Max Score
Reading ELA	Block	7	67.000	12.3288	4.6599	51.0	84.0
	Traditional	6	73.333	8.3586	3.4124	59.0	85.0
	Total	13	69.923	10.7662	2.9860	51.0	85.0
Mathematics	Block	6	49.333	12.8167	5.2324	30.0	69.0
	Traditional	6	56.000	11.0454	4.5092	42.0	69.0
	Total	12	52.667	11.9265	3.4429	30.0	69.0
Science	Block	6	45.167	15.5746	6.3583	27.0	69.0
	Traditional	6	63.667	10.7455	4.3868	50.0	81.0
	Total	12	54.417	16.0026	4.6196	27.0	81.0
Social Studies	Block	6	84.167	6.7057	2.7376	75.0	93.0
	Traditional	6	93.667	2.8048	1.1450	91.0	99.0
	Total	12	88.917	6.9734	2.0131	75.0	99.0

Note: variations in the campus number (N) is due to TEA population standards for reporting scored tests

Table 12 contains the ANOVA analysis for student performance in the African American subgroup for each of the four areas of the Texas Assessment of Knowledge and Skills. Mean scores in the high schools of the San Antonio Independent School District experienced a significant improvement in Science and Social Studies for this subgroup. Reading ELA and Mathematics achievement did change but the difference was not statistically significant. Mean score improvements returned p-values of .311 in Reading ELA, .357 for Mathematics, .038 in Social Studies and.009 in Science. A t-statistic and degrees of freedom are also reported for each content area. The sum of squares, degrees of freedom, mean square and F-statistic are also reported for each content area. ANOVA tested this data set at a confidence level of .05.

Table 12. ANOVA with sum of squares, degrees of freedom, mean square, F-statistic and p-value significance for African American performance with significance between block schedule (2003) and traditional schedule (2004) at the high schools of the San Antonio Independent School District in San Antonio, Texas.

African American		Sum of Squares	df	Mean Square	F	p-value
Reading ELA	Between Groups	129.590	1	129.590	1.130	.311
	Within Groups	1261.333	11	114.667		
	Total	1390.923	12			
Mathematics	Between Groups	133.333	1	133.333	.932	.357
	Within Groups	1431.333	10	143.133		
	Total	1564.667	11			
Science	Between Groups	1026.750	1	1026.750	5.735	.038*
	Within Groups	1790.167	10	179.017		
	Total	2816.917	11			
Social Studies	Between Groups	270.750	1	270.750	10.249	.009*
	Within Groups	264.167	10	26.417		
	Total	534.917	11			

$^*p<.05$

Table 13 presents the number of campuses (N), mean score, the standard deviation and standard mean error for the achievement of Hispanic students in the eight high schools of the San Antonio Independent School District).The mean score of this subgroup changed in each content area of the Texas Assessment of Knowledge and Skills after the transition to a traditional schedule. Eight observations or groupings of Hispanic students by campus held constant from 2003 to 2004. Standard deviation and standard error of the mean decreased in Reading ELA, and Social Studies, but increased in Mathematics and Science in 2004. The minimum and maximum observation values are also provided for each content area.

Table 13. Campus number (N), mean, standard deviation, standard mean error, minimum and maximum scores for Hispanic performance on block schedule (2003) and traditional schedule (2004) at the high schools of the San Antonio Independent School District in San Antonio, Texas.

Hispanic		N	Mean Score	Std. Deviation	Std. Mean Error	Min Score	Max Score
Reading ELA	Block	8	61.000	8.9921	3.1792	47.0	73.0
	Traditional	8	69.125	8.7902	3.1078	49.0	75.0
	Total	16	65.063	9.5601	2.3900	47.0	75.0
Mathematics	Block	8	45.625	8.8469	3.1279	35.0	62.0
	Traditional	8	54.125	9.0149	3.1872	33.0	62.0
	Total	16	49.875	9.6807	2.4202	33.0	62.0
Science	Block	8	38.500	6.9898	2.4713	32.0	52.0
	Traditional	8	56.375	8.8307	3.1221	38.0	65.0
	Total	16	47.438	12.0165	3.0041	32.0	65.0
Social Studies	Block	8	75.875	5.7678	2.0392	67.0	84.0
	Traditional	8	87.125	3.0909	1.0928	83.0	92.0
	Total	16	81.500	7.3303	1.8326	67.0	92.0

Table 14 contains the ANOVA analysis for student performance in the Hispanic subgroup for each of the four areas of the Texas Assessment of Knowledge and Skills. Mean scores in the high schools of the San Antonio Independent School District experienced a significant difference of improvement in Science and Social Studies for this subgroup. Reading ELA and Mathematics did not return a mean score difference of statistical significance. Comparisons for the Science and Social Studies content areas reject the presence of a null hypothesis as zero does not fall within their respective confidence intervals. Mean score improvements returned p-values of .089 in Reading ELA, .078 for Mathematics, .001 in Social Studies and a .001 value in Science. A t-statistic and degrees of freedom are also reported for each content area. The sum of squares, degrees of freedom, mean square and F-statistic are also reported for each content area. ANOVA tested this data set at a confidence level of .05.

Table 14. ANOVA with sum of squares, degrees of freedom, mean square, F-statistic and p-value significance for Hispanic performance with significance between block schedule (2003) and traditional schedule (2004) at the high schools of the San Antonio Independent School District in San Antonio, Texas.

Hispanic		Sum of Squares	df	Mean Square	F	p-value
Reading ELA	Between Groups	264.063	1	264.063	3.340	.089
	Within Groups	1106.875	14	79.063		
	Total	1370.938	15			
Mathematics	Between Groups	289.000	1	289.000	3.623	.078
	Within Groups	1116.750	14	79.768		
	Total	1405.750	15			
Science	Between Groups	1278.063	1	1278.063	20.152	.001*
	Within Groups	887.875	14	63.420		
	Total	2165.938	15			
Social Studies	Between Groups	506.250	1	506.250	23.645	.001*
	Within Groups	299.750	14	21.411		
	Total	806.000	15			

Table 15 contains the descriptive analysis of the number of campuses (N), mean score, standard deviation and standard error of the mean for the achievement of White students in the eight high schools of the San Antonio Independent School District. The mean score of this subgroup changed in each content area of the Texas Assessment of Knowledge and Skills after the transition to a traditional schedule. Seven observations or groupings of White students by campus held constant from 2003 to 2004 with the exception of Reading ELA. Standard deviation and standard error of the mean decreased in Reading ELA, Mathematics and Social Studies but increased in Science in 2004. The minimum and maximum observation values are also provided for each content area.

Table 15. Campus number (N), mean score, standard deviation, standard mean error, minimum and maximum scores for White performance on block schedule (2003) and traditional schedule (2004) at the high schools of the San Antonio Independent School District in San Antonio, Texas.

White		N	Mean Score	Std. Deviation	Std. Mean Error	Min Score	Max Score
Reading ELA	Block	8	78.000	14.5012	5.1270	59.0	99.0
	Traditional	7	81.857	8.6877	3.2836	71.0	91.0
	Total	15	79.800	11.8936	3.0709	59.0	99.0
Mathematics	Block	7	63.714	13.1366	4.9652	47.0	78.0
	Traditional	7	71.143	7.0339	2.6586	61.0	84.0
	Total	14	67.429	10.8324	2.8951	47.0	84.0
Science	Block	7	64.714	9.3758	3.5437	44.0	72.0
	Traditional	7	79.714	10.7038	4.0457	60.0	89.0
	Total	14	72.214	12.4108	3.3169	44.0	89.0
Social Studies	Block	7	87.714	12.3924	4.6839	63.0	96.0
	Traditional	7	93.286	5.4685	2.0669	83.0	99.0
	Total	14	90.500	9.6456	2.5779	63.0	99.0

Note: variations in the campus number (N) is due to TEA population standards for reporting scored tests

Table 16 contains the ANOVA analysis for student performance in the White subgroup for each of the four areas of the Texas Assessment of Knowledge and Skills. Mean scores in the high schools of the San Antonio Independent School District experienced statistical significance in the content area of Science for this subgroup. Reading ELA, Mathematics and Social Studies did not experience an improvement of statistical significance. Comparisons for these three content areas fail to reject the presence of a null hypothesis as zero does fall within their respective confidence intervals. Science achievement returned a p-value of .016. Mean score improvements returned a p-value of .551 in Reading ELA, .212 in Mathematics and .298 for Social Studies. The sum of squares, degrees of freedom, mean square and F-statistic are also reported for each content area. ANOVA tested this data set at a confidence level of .05.

Table 16. ANOVA with sum of squares, degrees of freedom, mean square, F-statistic and p-value significance for White performance with significance between block schedule (2003) and traditional schedule (2004) at the high schools of the San Antonio Independent School District in San Antonio, Texas.

White		Sum of Squares	df	Mean Square	F	p-value
Reading ELA	Between Groups	55.543	1	55.543	.375	.551
	Within Groups	1924.857	13	148.066		
	Total	1980.400	14			
Mathematics	Between Groups	193.143	1	193.143	1.740	.212
	Within Groups	1332.286	12	111.024		
	Total	1525.429	13			
Science	Between Groups	787.500	1	787.500	7.779	.016*
	Within Groups	1214.857	12	101.238		
	Total	2002.357	13			
Social Studies	Between Groups	108.643	1	108.643	1.184	.298
	Within Groups	1100.857	12	91.738		
	Total	1209.500	13			

$^*p<.05$

Table 17 contains the descriptive analysis of the number of campuses, mean score, standard deviation and standard error of the mean for the achievement of Special Education students in the eight high schools of the San Antonio Independent School District. The mean score of this subgroup changed in each content area of the Texas Assessment of Knowledge and Skills after the transition to a traditional schedule. Eight observations or groupings of Special Education students by campus held constant from 2003 to 2004. Standard deviation and standard error of the mean decreased in Mathematics, Science and Social Studies but increased in Reading ELA in 2004. The minimum and maximum observation values are also provided for each content area.

Table 17. Campus number (N), mean score, standard deviation, standard mean error, minimum and maximum scores for Special Education performance on block schedule (2003) and traditional schedule (2004) at the high schools of the San Antonio Independent School District in San Antonio, Texas.

Special Education		N	Mean	Std. Deviation	Std. Mean Error	Min Score	Max Score
Reading ELA	Block	8	30.875	13.3463	4.7186	16.0	58.0
	Traditional	8	40.125	13.7263	4.8530	22.0	54.0
	Total	16	35.500	13.9236	3.4809	16.0	58.0
Mathematics	Block	8	23.500	11.0841	3.9188	8.0	38.0
	Traditional	8	24.750	10.1383	3.5844	7.0	34.0
	Total	16	24.125	10.2819	2.5705	7.0	38.0
Science	Block	8	18.625	11.4010	4.0309	1.0	32.0
	Traditional	8	37.625	9.8116	3.4689	22.0	49.0
	Total	16	28.125	14.2074	3.5518	1.0	49.0
Social Studies	Block	8	49.875	16.6685	5.8932	32.0	84.0
	Traditional	8	70.875	10.9079	3.8565	59.0	91.0
	Total	16	60.375	17.4007	4.3502	32.0	91.0

Table 18 contains the ANOVA analysis for student performance in the Special Education subgroup for each of the four areas of the Texas Assessment of Knowledge and Skills. Mean scores in the high schools of the San Antonio Independent School District experienced statistical significance in Science and Social Studies for this subgroup. The content areas of Reading ELA and Mathematics could not reject the null hypothesis and failed to return a difference of statistical significance. Comparisons for Science and Social Studies reject the presence of a null hypothesis as zero does not fall within their respective confidence intervals. Mean score improvements returned a p-value of .193 in Reading ELA, .817 for Mathematics, .003 in Science and .010 points in Science. The sum of squares, degrees of freedom, mean square and F-statistic are also reported for each content area. ANOVA tested this data set at a confidence level of .05.

Table 18. ANOVA with sum of squares, degrees of freedom, mean square, F-statistic and p-value significance for Special Education performance with significance between block schedule (2003) and traditional schedule (2004) at the high schools of the San Antonio Independent School District in San Antonio, Texas.

Special Education		Sum of Squares	df	Mean Square	F	p-value
Reading ELA	Between Groups	342.250	1	342.250	1.867	.193
	Within Groups	2565.750	14	183.268		
	Total	2908.000	15			
Mathematics	Between Groups	6.250	1	6.250	.055	.817
	Within Groups	1579.500	14	112.821		
	Total	1585.750	15			
Science	Between Groups	1444.000	1	1444.000	12.765	.003*
	Within Groups	1583.750	14	113.125		
	Total	3027.750	15			
Social Studies	Between Groups	1764.000	1	1764.000	8.891	.010*
	Within Groups	2777.750	14	198.411		
	Total	4541.750	15			

$^*p<.05$

Table 19 contains the descriptive analysis of mean score, the number of campuses (N), standard deviation and standard error of the mean for the achievement of Economically Disadvantaged students in the eight high schools of the San Antonio Independent School District. The mean score of this subgroup changed in each content area of the Texas Assessment of Knowledge and Skills after the transition to a traditional schedule. Eight observations or groupings of Economically Disadvantaged students by campus held constant from 2003 to 2004. Standard deviation and standard error of the mean decreased in Reading ELA, Mathematics, Science and Social Studies in 2004. The minimum and maximum observation values are also provided for each content area.

Table 19. Campus number (N), mean score, standard deviation, standard mean error, minimum and maximum scores for Economically Disadvantaged performance on block schedule (2003) and traditional schedule (2004) at the high schools of the San Antonio Independent School District in San Antonio, Texas.

Economic Disadvantage		N	Mean Score	Std. Deviation	Std. Mean Error	Min Score	Max Score
Reading ELA	Block	8	62.375	7.7078	2.7251	51.0	73.0
	Traditional	8	70.875	5.9866	2.1166	57.0	75.0
	Total	16	66.625	7.9823	1.9956	51.0	75.0
Mathematics	Block	8	45.625	9.7825	3.4586	30.0	62.0
	Traditional	8	55.750	6.4973	2.2971	41.0	62.0
	Total	16	50.688	9.5758	2.3939	30.0	62.0
Science	Block	8	38.625	8.4505	2.9877	26.0	53.0
	Traditional	8	57.750	6.1354	2.1692	47.0	64.0
	Total	16	48.188	12.1832	3.0458	26.0	64.0
Social Studies	Block	8	76.875	6.2892	2.2236	68.0	84.0
	Traditional	8	88.125	2.3566	.8332	85.0	92.0
	Total	16	82.500	7.4027	1.8507	68.0	92.0

Table 20 contains the ANOVA analysis for student performance in the Economically Disadvantaged subgroup for each of the four areas of the Texas Assessment of Knowledge and Skills. Mean scores in the high schools of the San Antonio Independent School District experienced statistical significance in Reading ELA, Mathematics, Science and Social Studies for this subgroup. Comparisons for all content areas reject the presence of a null hypothesis as zero does not fall within their respective confidence intervals. Mean score improvements returned a p-value of .027 in Reading ELA, .029 for Mathematics, .001 in Social Studies and a .001 value in Science. The sum of squares, degrees of freedom, mean square and F-statistic are also reported for each content area. ANOVA tested this data set at a confidence level of .05.

Table 20. ANOVA with sum of squares, degrees of freedom, mean square, F-statistic and p-value significance for Economically Disadvantaged performance with significance between block schedule (2003) and traditional schedule (2004) at the high schools of the San Antonio Independent School District in San Antonio, Texas.

Economic Disadvantage		Sum of Squares	df	Mean Square	F	p-value
Reading ELA	Between Groups	289.000	1	289.000	6.068	.027*
	Within Groups	666.750	14	47.625		
	Total	955.750	15			
Mathematics	Between Groups	410.063	1	410.063	5.947	.029*
	Within Groups	965.375	14	68.955		
	Total	1375.438	15			
Science	Between Groups	1463.063	1	1463.063	26.832	.001*
	Within Groups	763.375	14	54.527		
	Total	2226.438	15			
Social Studies	Between Groups	506.250	1	506.250	22.447	.001*
	Within Groups	315.750	14	22.554		
	Total	822.000	15			

***p<.05**

Table 21 contains the descriptive analysis of mean score, the number of campuses (N), standard deviation and standard error of the mean for the achievement of Special Education students in the eight high schools of the San Antonio Independent School District. The mean score of this subgroup changed in each content area of the Texas Assessment of Knowledge and Skills after the transition to a traditional schedule. Eight observations or groupings of Special Education students by campus held constant from 2003 to 2004. Standard deviation and standard error of the mean decreased in Reading ELA, and Social Studies, but increased in Mathematics and Science in 2004.

Table 21. Campus number (N), mean score, standard deviation, standard mean error, minimum and maximum scores for Limited English Proficient performance on block schedule (2003) and traditional schedule (2004) at the high schools of the San Antonio Independent School District in San Antonio, Texas.

LEP		N	Mean Score	Std. Deviation	Std. Mean Error	Min Score	Max Score
Reading ELA	Block	8	20.000	9.9857	3.5305	10.0	40.0
	Traditional	8	22.000	7.4066	2.6186	6.0	30.0
	Total	16	21.000	8.5557	2.1389	6.0	40.0
Mathematics	Block	8	21.000	7.4833	2.6458	11.0	31.0
	Traditional	8	29.875	8.6757	3.0673	11.0	37.0
	Total	16	25.438	9.0699	2.2675	11.0	37.0
Science	Block	8	16.125	4.7940	1.6949	10.0	23.0
	Traditional	8	22.375	12.1413	4.2926	1.0	39.0
	Total	16	19.250	9.4833	2.3708	1.0	39.0
Social Studies	Block	8	46.750	14.3602	5.0771	25.0	65.0
	Traditional	8	56.375	7.6520	2.7054	42.0	67.0
	Total	16	51.563	12.1763	3.0441	25.0	67.0

Table 22 contains the ANOVA analysis for student performance in the Special Education subgroup for each of the four areas of the Texas Assessment of Knowledge and Skills. Mean scores in the high schools of the San Antonio Independent School

District experienced statistical significance in Mathematics for this subgroup. The content areas of Reading ELA, Science and Social Studies could not reject the null hypothesis and failed to return a difference of statistical significance. A comparison of Mathematics performance rejects the presence of a null hypothesis as zero does not fall within its respective confidence interval. Mean score improvements retuned a p-value of .656 in Reading ELA, .046 in Mathematics, .197 for Science and a value of .117 in Social Studies. The sum of squares, degrees of freedom, mean square and F-statistic are also reported for each content area. ANOVA tested this data set at a confidence level of .05.

Table 22. ANOVA with sum of squares, degrees of freedom, mean square, F-statistic and p-value significance for Limited English Proficient performance with significance between block schedule (2003) and traditional schedule (2004) at the high schools of the San Antonio Independent School District in San Antonio, Texas.

LEP		Sum of Squares	df	Mean Square	F	p-value
Reading ELA	Between Groups	16.000	1	16.000	.207	.656
	Within Groups	1082.000	14	77.286		
	Total	1098.000	15			
Mathematics	Between Groups	315.063	1	315.063	4.800	.046*
	Within Groups	918.875	14	65.634		
	Total	1233.938	15			
Science	Between Groups	156.250	1	156.250	1.834	.197
	Within Groups	1192.750	14	85.196		
	Total	1349.000	15			
Social Studies	Between Groups	370.563	1	370.563	2.799	.117
	Within Groups	1853.375	14	132.384		
	Total	2223.938	15			

***p<.05**

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The review of pertinent literature that was presented in its entirety in Chapter II of this study, *Review of Literature*, emphasized the importance of quality master scheduling and the need to understand the concept of effective use of instructional time in the our schools. There is however no pervasive claim to a single best scheduling model that all high school campuses should begin to utilize. This literature review, if clear about nothing else, should be marked evidence that substantial divisiveness does indeed exist about the applicability of various options for scheduling structure. In addition, even the sparse evidence that is currently available to support one model in favor of another becomes ambiguous at best when countered with claims from the opposing side of the scheduling argument.

The debate is clearly oriented to certain characteristics of environment. We must question the quality of administrative behavior, parent and community involvement, student populations and various aspects of teacher training. It cannot simply be, for example, a matter of promoting a traditional schedule in one school because it worked on another campus or because the block schedule is simply not returning the anticipated performance results. There is much more to this intricate school reform issue; an issue we have yet to appreciate due to the absence of empirical information in either direction and the contradictory positions of the research that is available. This final chapter (5), Summary of Conclusions and Recommendations, provides a summary of the literature review made in the context of the findings of this study. These major conclusions are followed by recommendations for practical operations and for further research and study.

Research Question Number One

Does a transition from a block scheduling model to a traditional scheduling model impact student performance as identified by the Academic Excellence Indicator System (AEIS) database in the high schools of the San Antonio Independent School District?

The findings of this research and study that compared student performance in the seven general performance areas of Attendance, Advanced Courses (AC) participation, Advanced Placement (AP) and International Baccalaureate (IB) scoring results, SAT Mean Average, ACT Mean Average and Cost, indicate mixed returns for statistical significance. Data was analyzed after the eight high schools of the San Antonio Independent School District each respectively transitioned to a traditional schedule in 2003-2004. The information presented in Tables 5 and 6 indicate that student attendance did not improve on a traditional schedule, nor was their statistical significance in favor of either model. There was statistical significance in the number of students on a traditional schedule when compared to a block schedule participating in AC courses, but a statistical decline was returned in AP and IB scores. The mean averages of the SAT and ACT did not show significant improvement on a traditional schedule.

Research on the San Antonio Independent School District support studies done by Kelchner (2003) and Hodges (2002) that student attendance is not affected by the implementation and maintenance of a block or traditional schedule. However, it contradicts findings by Deuel (1999) that returned statistical significance in favor of block scheduling for improving student participation in advanced courses or dual enrollment. The traditional schedule in this SAISD study was more conducive to increasing advanced course enrollment. It can be inferred that these increased enrollments have precipitated weaker scoring results in the AP and IB testing. More students of diverse ability levels are taking these tests. The mean of both SAT and ACT scores experienced slight improvement on a traditional schedule but not to the statistically significant threshold of .05. Prior studies done by Evans et al. (2002) and Lare et al. (2002) returned more favorable data for these standardized assessments than did the evaluation on the SAISD.

Implications for Practice

A transition to a traditional schedule from that of a block system does not necessarily guarantee improvement in the general areas that measure student performance. In addition, even when improvement is returned, statistical significance will not always occur. School districts should not then make decisions to implement a traditional schedule based solely on the prospect of improving attendance or scores on SAT and ACT assessments. However, it is reasonable to expect that AC participation and AP/IB scores will increase on a traditional schedule based on the data collected from the high schools of the SAISD.

Research Question Number Two

Does a transition from a block scheduling model to a traditional scheduling model impact student performance in core academic areas as identified by the Academic Excellence Indicator System (AEIS) database in the high schools of the San Antonio Independent School District?

The findings of this research and study that compared student performance in the four core academic areas indicate no significant improvement when measuring each campus individually, but there was significant improvement when examining the core areas across all campuses. Data was analyzed after the eight high schools of the San Antonio Independent School District each respectively transitioned to a traditional schedule in 2003-2004. The first statistical analysis was conducted independently for each campus and measured performance using aggregate, all test returns on the Texas Assessment of Knowledge and Skills. The data is presented in Tables 7 and 8. A second analysis format examined each content area of the TAKS independently without regard to campus location. All core areas – Reading and ELA, Mathematics, Science and Social Studies – returned statistical significance at the .05 level after a transition to traditional schedule. Tables 9 and 10 present this information.

A separate analysis of each high school in the San Antonio Independent School District did not return statistical significance. This all test examination measured scoring means without regard to content area and irrespective of other disaggregate information. However, the analysis of student performance data on the each area of the TAKS indicate a positive recommendation for school districts that are considering a transition from a block schedule to a traditional model. Significant improvement was experienced in every TAKS area when analyzed collectively for all campuses by the content area. Unlike mixed finding studies from Arnold (2002), Drummond (2001), Hess et al. (1999) and Deuel (1999), the implication for the high schools of the SAISD is confirmation for their decision to make a scheduling transition away from the A-B block system when examining each content area separately.

This research supports prior studies offered by Gruber and Onwuegbuzie (2001), Garza (2001) and Lawrence and McPherson (2000) that also returned empirical evidence to favor a traditional master schedule over that of a block. A transition from a block schedule to traditional schedule had a statistically significant impact on student performance as identified by TAKS scores in Reading ELA, Mathematics, Science and Social Studies in the high schools of the SAISD. It also suggests that broadening the sample for research – individual campus results versus all campuses by core content area – will return statistical significance of improvement in favor of a traditional schedule.

Implications for Practice

Based on the findings of this study, converting to a traditional schedule from a block system will return practical improvement at the campus level and statistically significant improvement for large districts with multiple high schools, when evaluating student performance on the TAKS. Increasing the number of participants for research improves the overall impact of the data analysis. A traditional schedule has the potential for improving TAKS scoring in the core content areas of Reading/ELA, Mathematics, Science and Social Studies. School districts that are considering a transition from a block schedule to that of a traditional model can anticipate increased performance returns on their standardized assessments. Multiple high school campus districts can expect the most significant improvement versus smaller, single high school systems. Individual campuses may only experience a practical improvement on TAKS related scoring.

Research Question Number Three

Does a transition from a block scheduling model to a traditional scheduling model impact the performance of subgroup student populations as identified by the Academic Excellence Indicator System (AEIS) database in the high schools of the San Antonio Independent School District?

The findings of this research and study that compared the student performance of African American, Hispanic, White, Special Education, Economically Disadvantaged and Limited English Proficient students in the four core content areas indicate mixed results for significance for all eight high schools of the SAISD after the transition to a traditional schedule in 2003-2004. Each of these ethnicity and program subgroups were independently analyzed in the areas of Reading ELA, Mathematics, Science and Social Studies. The African American and Hispanic subgroups experienced statistical significance in the content areas of Reading ELA and Mathematics but failed to do so in Science and Social Studies. Students in the White subgroup showed significant improvement in the content area of Science only. The Special Education subgroup showed statistically significant improvement in Science and Social Studies. Economically Disadvantaged students benefited most dramatically from the transition to a traditional schedule as all TAKS content areas improved beyond the statistically significant threshold of .05. The Limited English Proficient subgroup experienced significant improvement in Mathematics but did not do so in Reading ELA, Science or Social Studies. The complete data analysis of this information is respectively presented in Tables 11 through 22.

The analysis of subgroup performance on the Texas Assessment of Knowledge and Skills (TAKS) returned mixed findings for statistical significance. This study on the high schools of the San Antonio Independent School District supports previous research done by Spencer-Pugh (2002) and Stirling (2001) on African American performance. In both instances there was a mixed endorsement for schedule preference depending upon the particular domain being analyzed. The Kelchner (2003) study agrees with the SAISD examination in the content areas of Reading ELA and Mathematics but found contradiction in Science and Social Studies. Similar comparisons can be made with

Kelchner (2003) and the respective data outcome made in the Hispanic and White subgroups. There was no significant improvement in Reading ELA or Mathematics for the Hispanic population or in Reading ELA, Mathematics or Social studies for the White subgroup.

A Bottge et al. study in 2004 suggested that schedule format does not predicate the performance characteristics of Special Education students. The subgroup examination of the Special Education subgroup in the SAISD can support this claim in the areas of Reading ELA and Mathematics. However, a direct contrast was present in Science and Social Studies where the traditional schedule returned significant improvement when compared to a block format. The most dramatic increase in mean score was in the Economically Disadvantaged subgroup. This data supports research done by Garza (2001) where block scheduling was shown to have a significantly negative impact on student performance in minority subgroups, the economically disadvantaged and those with limited English proficiency.

Hinson (2000) however found no statistical difference in the comparison of Limited English Proficient (LEP) students on a block and traditional schedule. The SAISD study returned significance for the LEP subgroup only in the content area of Mathematics. A transition from a block schedule to traditional schedule had practical significant and statistically significant impact on student performance. This outcome however is dependent upon the TAKS content area for each of subgroups that includes African American, Hispanic, White, Special Education, Economically Disadvantaged and Limited English Proficient students in the SAISD.

Implications for Practice

A traditional schedule serves a greater benefit in TAKS performance to the student subgroups of African American, Hispanic, White, Special Education, Economically Disadvantaged and Limited English Proficient when compared to a block schedule. Statistical significance varied across each subgroup but no less than practical improvement was consistent in each. The largest of the subgroups by enrollment – Economically Disadvantaged – experienced the most success with significant improvement in each of the four core content areas. Increasing the number of participants for research improves the overall impact of the data analysis. White and Limited English Proficient students had the smallest practical improvement and significance in only one academic area. School districts can anticipate improvement within each subgroup for each TAKS field when considering a transition to a traditional schedule. Statistical significance has the potential to vary according to the respective subgroup.

Recommendations for Practice

This study was designed to determine the degree of impact that master scheduling models have on student performance as identified by the Academic Excellence Indicator System database in the eight high schools of the San Antonio Independent School District. Conclusions have been made as to the degree of influence that traditional and block schedules have on student performance. Both the core academic areas and certain definable student subgroup populations have been studied in addition to the whole enrollments of these campuses and other general performance characteristics. The review of literature, each of the findings returned during the course of this study and their subsequent conclusions provide the basis for the following recommendations for practical application:

1. The implication of this study is that **Attendance** did not return statistical significance in the high schools of the SAISD at a .05 level after the transition to a traditional schedule.
2. The implication of this study is that **Advanced Course** participation and **Advanced Placement and International Baccalaureate** testing results returned statistical significance in the high schools of the SAISD at a .05 level after the transition to a traditional schedule.
3. The implication of this study is that **SAT** and **ACT** averages did not return statistical significance in the high schools of the SAISD at a .05 level after the transition to a traditional schedule.
4. The implication of this study is that **TAKS Performance by Campus** as measured by all tests taken did not include statistical significance in the eight high schools of the SAISD at a level of .05 after the transition to a traditional schedule.
5. The implication of this study is that **TAKS Reading/ELA, Mathematics, Science and Social Studies** scores returned statistical significance in the high schools of the SAISD at a .05 level after the transition to a traditional schedule.

6. The implication of this study is that **African American, Hispanic and Special Education Performance** in TAKS Science and TAKS Social Studies experienced statistical significance at .05 after the transition to a traditional schedule.
7. The implication of this study is that **White Performance** experienced statistical significance in TAKS Science at a level of .05 after the transition to a traditional schedule.
8. The implication of this study is that **Economically Disadvantaged Performance** experienced statistical significance in each area of the TAKS assessment at a level of .05 after the transition to a traditional schedule.
9. The implication of this study is that **Limited English Proficient Performance** returned statistical significance in TAKS Mathematics at a level of .05 after the transition to a traditional schedule.

Recommendations for Further Research

The scope of this study is limited to the information acquired from the literature review and analysis of data from the high schools of the San Antonio Independent School District (SAISD). Each of the nine recommendations for practice are limited to these selected campuses, thus the findings of this study may not be generalized to any group other than the high schools of the SAISD. However, the intent of this study was to contribute both methodological protocol and additional research-based literature to the broader debate on master scheduling models – traditional versus block. The examination of educational reform must continue beyond this study so as to provide practitioners sound, empirical reasoning for the decisions they make. The review of literature, each of the findings returned during the course of this study and their subsequent conclusions provide the basis for the following recommendations for further research:

1. Further research of master scheduling models at the high school level should include **student populations and school characteristics** that are comparable in the areas of subgroup enrollments, school location, teacher certification and experience, school district resources and professional development accessibility.
2. Further research of master scheduling models at the high school level should include an analysis of multiple **student assessment formats** such as grade point averages, end of course examinations and other standardized tests.
3. Further research of master scheduling models at the high school level should include an analysis of **disaggregate student populations** such as African American, Hispanic, White, Special Education, Economically Disadvantaged and Limited English Proficient.
4. Further research of master scheduling models at the high school level should include an analysis of **instructional methodology** and the appropriateness of various teaching strategies with regard to which schedule modeling is being utilized.
5. Further research of master scheduling models at the high school level should include an analysis of **content area curriculum** and **longitudinal achievement** between traditional and block schedules to better determine which model is best for certain core areas.

6. Further research of master scheduling models at the high school level should include an analysis of **factors beyond student achievement** such as climate, culture and environmental circumstance.

7. Further research of master scheduling models at the high school level must include an analysis **educational expense and cost effectiveness** in the areas of instructional and administrative expenditures.

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APPENDIX A

TAKS STUDENT PERFORMANCE

TAKS STUDENT PERFORMANCE	CAMPUS 2003	CAMPUS 2004	AF AMER 2003	AF AMER 2004	HISPANIC 2003	HISPANIC 2004	WHITE 2003	WHITE 2004	SPEC ED 2003	SPEC ED 2004	ECON DISA 2003	ECON DISA 2004	LIM ENG PROF 2003	LIM ENG PROF 2004
001														
READING ELA	72.0	76.0	68.0	76.0	71.0	75.0	93.0	90.0	19.0	22.0	71.0	74.0	22.0	24.0
MATHEMATICS	56.0	58.0	56.0	47.0	55.0	58.0	78.0	84.0	8.0	7.0	55.0	57.0	28.0	30.0
SCIENCE	54.0	66.0	69.0	62.0	52.0	65.0	70.0	89.0	14.0	28.0	53.0	63.0	15.0	26.0
SOCIAL STUDIES	82.0	90.0	89.0	99.0	80.0	89.0	96.0	99.0	50.0	65.0	81.0	88.0	42.0	61.0
002														
READING ELA	62.0	75.0	*	*	62.0	75.0	86.0	83.0	39.0	53.0	64.0	75.0	20.0	22.0
MATHEMATICS	44.0	59.0	*	*	43.0	59.0	71.0	67.0	17.0	26.0	45.0	60.0	22.0	27.0
SCIENCE	35.0	54.0	*	*	34.0	54.0	67.0	89.0	7.0	48.0	35.0	52.0	12.0	20.0
SOCIAL STUDIES	69.0	84.0	*	*	69.0	84.0	92.0	89.0	32.0	91.0	69.0	85.0	38.0	57.0
003														
READING ELA	60.0	74.0	67.0	73.0	59.0	74.0	71.0	91.0	35.0	54.0	60.0	74.0	10.0	28.0
MATHEMATICS	40.0	58.0	47.0	64.0	40.0	57.0	47.0	73.0	32.0	34.0	40.0	58.0	11.0	37.0
SCIENCE	40.0	65.0	40.0	81.0	39.0	64.0	67.0	86.0	31.0	49.0	40.0	64.0	19.0	37.0
SOCIAL STUDIES	73.0	90.0	75.0	94.0	74.0	90.0	63.0	95.0	50.0	79.0	73.0	90.0	40.0	67.0
004														
READING ELA	55.0	68.0	51.0	73.0	55.0	68.0	59.0	71.0	24.0	47.0	57.0	71.0	10.0	24.0
MATHEMATICS	40.0	58.0	47.0	64.0	40.0	57.0	47.0	73.0	32.0	34.0	40.0	58.0	11.0	37.0
SCIENCE	35.0	57.0	33.0	62.0	35.0	57.0	67.0	71.0	27.0	45.0	34.0	59.0	11.0	22.0
SOCIAL STUDIES	69.0	85.0	78.0	91.0	67.0	85.0	79.0	83.0	53.0	75.0	68.0	86.0	25.0	55.0

TAKS STUDENT PERFORMANCE	CAMPUS 2003	CAMPUS 2004	AF AMER 2003	AF AMER 2004	HISPANIC 2003	HISPANIC 2004	WHITE 2003	WHITE 2004	SPEC ED 2003	SPEC ED 2004	ECON DISA 2003	ECON DISA 2004	LIM ENG PROF 2003	LIM ENG PROF 2004
005														
READING ELA	68.0	73.0	66.0	74.0	67.0	72.0	76.0	78.0	29.0	28.0	67.0	72.0	27.0	24.0
MATHEMATICS	49.0	53.0	47.0	50.0	47.0	52.0	65.0	71.0	26.0	13.0	48.0	53.0	22.0	27.0
SCIENCE	43.0	58.0	45.0	57.0	39.0	56.0	66.0	83.0	14.0	22.0	42.0	58.0	19.0	15.0
SOCIAL STUDIES	82.0	89.0	85.0	93.0	79.0	87.0	94.0	95.0	36.0	59.0	82.0	89.0	65.0	53.0
006														
READING ELA	51.0	57.0	53.0	59.0	47.0	49.0	60.0	89.0	16.0	22.0	51.0	57.0	17.0	6.0
MATHEMATICS	32.0	40.0	30.0	42.0	35.0	33.0	60.0	61.0	9.0	23.0	30.0	41.0	26.0	11.0
SCIENCE	29.0	47.0	27.0	50.0	32.0	38.0	44.0	60.0	1.0	32.0	26.0	47.0	23.0	1.0
SOCIAL STUDIES	82.0	89.0	85.0	93.0	79.0	87.0	94.0	95.0	36.0	59.0	82.0	89.0	65.0	53.0
007														
READING ELA	74.0	74.0	84.0	85.0	73.0	74.0	80.0	71.0	58.0	47.0	73.0	75.0	40.0	30.0
MATHEMATICS	63.0	62.0	69.0	69.0	62.0	62.0	78.0	69.0	38.0	27.0	62.0	62.0	31.0	35.0
SCIENCE	47.0	64.0	57.0	70.0	45.0	64.0	72.0	80.0	32.0	36.0	46.0	64.0	20.0	39.0
SOCIAL STUDIES	85.0	92.0	93.0	92.0	84.0	92.0	96.0	97.0	84.0	66.0	84.0	92.0	58.0	63.0
008														
READING ELA	54.0	67.0	80.0	*	54.0	66.0	99.0	*	27.0	48.0	56.0	69.0	14.0	18.0
MATHEMATICS	43.0	55.0	*	*	43.0	55.0	*	*	26.0	34.0	45.0	57.0	17.0	35.0
SCIENCE	33.0	53.0	*	*	32.0	53.0	*	*	23.0	41.0	33.0	55.0	10.0	19.0
SOCIAL STUDIES	76.0	83.0	*	*	75.0	83.0	*	*	58.0	73.0	76.0	86.0	41.0	42.0

APPENDIX B

GENERAL STUDENT DEMOGRAPHICS

AND

PERFORMANCE

	CAMPUS 2003	CAMPUS 2004	AF AMER 2003	AF AMER 2004	HISPANIC 2003	HISPANIC 2004	WHITE 2003	WHITE 2004	SPEC ED 2003	SPEC ED 2004	ECON DISA 2003	ECON DISA 2004	LIM ENG PROF 2003	LIM ENG PROF 2004
ENRL														
001	2002	1898	113.0	99.0	1816	1726	70.0	68.0	227.0	211.0	1720	1544	180.0	137.0
002	1346	1313	3.0	3.0	1319	1287	24.0	23.0	221.0	224.0	1093	1053	162.0	147.0
003	1728	1683	34.0	39.0	1619	1581	67.0	56.0	230.0	254.0	1548	1525	194.0	196.0
004	1726	1728	143.0	123.0	1536	1565	43.0	33.0	226.0	231.0	1461	1388	214.0	211.0
005	2214	2181	200.0	192.0	1771	1771	234.0	210.0	311.0	314.0	1824	1787	130.0	104.0
006	1227	1140	782.0	726.0	405	365	39.0	46.0	272.0	263.0	986	892	54.0	37.0
007	1854	1917	59.0	51.0	1691	1771	94.0	89.0	281.0	286.0	1646	1691	150.0	127.0
008	1590	1482	9.0	9.0	1569	1470	11.0	3.0	278.0	281.0	1325	1178	200.0	157.0
ATTN														
001	92.9	93.6	93.6	92.8	92.7	93.6	94.2	94.4	89.7	92.2	93.1	93.3	92.9	95
002	92.8	93.4	*	96.1	92.9	93.4	90.6	90.7	91.7	93.3	93.2	93.6	93.4	94.7
003	91.7	93.3	94.9	95.9	91.7	93.3	91.0	92.6	89.3	93	92.0	93.3	91.7	95.1
004	91.7	90.7	92.4	90.9	91.7	90.7	91.9	89.2	90.4	90.3	92.2	91.3	93.2	92.9
005	93.1	91.9	93.0	91.8	92.9	91.9	94.2	92.7	91.4	91.8	93.3	91.9	93.5	92.9
006	91.8	91.7	93.0	92.6	89.5	89.7	92.7	92.6	90.7	91.7	92.1	92	92.4	91.7
007	91.7	89	92.5	92.8	91.7	88.9	91.5	89.2	90.0	88.9	91.8	88.7	93.1	92.6
008	91.6	91.9	91.2	95.9	91.6	91.9	88.1	88	89.2	90.6	92.1	92.3	91.6	93.3

AC	CAMPUS 2003	CAMPUS 2004	AF AMER 2003	AF AMER 2004	HISPANIC 2003	HISPANIC 2004	WHITE 2003	WHITE 2004	SPEC ED 2003	SPEC ED 2004	ECON DISA 2003	ECON DISA 2004	LIM ENG PROF 2003	LIM ENG PROF 2004
001	29.5	41.9	29.3	39.4	28.6	41.2	51.4	63.2	5.4	4.4	29.6	38.5	11.2	4.3
002	14.5	39.9	*	66.7	14.5	39.8	16.0	43.5	2.3	2.7	15.2	41.6	9.0	4
003	16.6	41.8	24.3	61.5	16.1	41.1	23.7	48.2	2.9	5.6	16.4	41.8	3.3	13.8
004	16.3	27.2	19.0	33.3	16.2	26.6	8.9	21.2	2.9	1.9	16.8	29.8	12.7	
005	16.1	34.8	15.5	27.1	15.7	33.5	19.1	51.9	2.7	2.9	17.4	34	14.4	6.4
006	17.9	27.9	20.2	32.5	13.5	19.5	19.1	21.7	4.9	24.3	18.2	28.6	7.4	
007	15.1	33.3	17.0	58.8	14.9	32.5	17.5	37	6.5	9.5	15.5	32.1	10.7	19.6
008	14.8	42.8	11.1	44.4	14.8	42.6	27.3		3.1	11.5	15.6	44.9	4.4	6.4

APPENDIX C

GENERAL STUDENT PERFORMANCE

	CAMPUS 2003	CAMPUS 2004	AF AMER 2003	AF AMER 2004	HISPANIC 2003	HISPANIC 2004	WHITE 2003	WHITE 2004
AP/IB RESULTS								
001	33.9	21.5	39.2	11	32.3	21.2	52.8	38.9
002	32.0	32.1			31.6	33.8	57.1	
003	28.2	2.7	57.1	12.5	26.5	1.5	48.3	14.3
004	17.8	19.5	25.9	12.5	17.2	19.1	7.7	33.3
005	21.6	16.6	19.1	0	20.6	15.3	29.1	28
006	33.9	0	33.4	0	33.9	0	50.0	
007	18.5	27.6	22.2		18.3	30.6	19.4	
008	28.7	6.1			28.8	6.5	20.0	
SAT MEAN								
001	876.0	869	850.0	783	875.0	890	1027.0	930
002	785.0	805	744.0		790.0	808		
003	774.0	821	783.0	743	776.0	824	879.0	871
004	788.0	804	762.0	743	819.0	809		
005	807.0	822	733.0	759	820.0	811	920.0	944
006	726.0	734	697.0	721	767.0	778		
007	845.0	835		853	818.0	829	934.0	901
008	773.0	780	670.0	723	762.0	777		
ACT MEAN								
001	17.7	17.9	18.2	17.5	17.7	17.8	21.0	23
002	16.6	16.6		0	16.7	16.2		24.5
003	16.9	16.7		18	16.1	16.5	20.6	21
004	16.8	17.3	16.0	14	16.7	16.5		30
005	17.0	17.2	15.3	14.8	16.9	16.8	17.9	19.6
006	15.4	15.6	14.5	15.5	17.3	15.9		
007	16.5	17.7			16.4			
008	16.8	16.1		13	16.5	15.5		

	INSTRUCT 2003	INSTRUCT 2004	ADMIN 2003	ADMIN 2004
COST				
001	$7,671,762.00	$6,915,284.00	$718,006.00	$712,510.00
002	$5,891,922.00	$5,423,490.00	$525,785.00	$518,262.00
003	$6,968,791.00	$6,332,763.00	$618,193.00	$631,642.00
004	$6,677,093.00	$6,578,639.00	$595,387.00	$612,639.00
005	$8,612,300.00	$8,096,170.00	$705,260.00	$686,902.00
006	$6,043,405.00	$5,390,496.00	$611,114.00	$569,349.00
007	$7,538,620.00	$7,150,992.00	$613,506.00	$630,261.00
008	$7,098,341.00	$5,935,114.00	$631,917.00	$620,299.00

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