THE IMPACT OF BLOCK SCHEDULING ON STUDENT ACHIEVEMENT, ATTENDANCE, AND DISCIPLINE AT THE HIGH SCHOOL LEVEL

A Dissertation

Submitted to the
Faculty of Argosy University Online
College of Education

In Partial Fulfillment of
The Requirements for the Degree of

Doctor of Education

by

Charles Williams Jr.

December 2011

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Abstract of Dissertation

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ABSTRACT

The purpose of this study was to determine the impact block scheduling has on (a) student academic achievement, discipline, and attendance, and (b) administrator, teacher, and student perceptions. The study compared 2005–2010 data from a high school utilizing the A/B block schedule and a high school under a traditional schedule, in one suburban school district. The study used mixed methods. The quantitative data described, analyzed, and interpreted reading and math FCAT scores, attendance rates, and discipline referrals from 2005–2010. A total of seven repeated ANOVAs were conducted to analyze the difference between the two schedule designs with respect to two achievement indicators; reading and math FCAT scores. The qualitative data offered a voice to administrators, teachers, and students, and was gathered through individual face-to-face, email, or phone interviews. The quantitative findings for the study yielded the following conclusions: (1) students experienced higher FCAT reading scores on the A/B block schedule than the traditional schedule; (2) students experienced higher FCAT math scores under the traditional schedule than the A/B block schedule; (3) attendance rates decreased for students under the A/B block schedule and increased for students under the traditional schedule; and (4) discipline referrals decreased at a higher rate for students under the traditional schedule than students under the A/B block schedule. The administrator, teacher, and student perceptions contributed to the following qualitative findings for the study: (1) block scheduling fosters extended learning sessions when properly planned; (2) with fewer transitions discipline issues decreased; (3) attendance was not affected by the block schedule; (4) block schedule allows for the implementation of various instructional strategies; and (5) transitioning from a traditional to a block

schedule was thought to be difficult at first, but attainable, and would alleviate any feelings of being rushed.

DEDICATION

I would like to dedicate this dissertation to my family. To my beautiful wife, Betsy Marie, none of this would have been possible without your relentless love, encouragement, criticism, and sacrifices made during this turbulent educational journey.

To my precious daughter, Elyn Marie, whose smile gives me strength to continue on amidst the toughest circumstances. I pray she comes to realize that the only limitations in life are the ones we place on ourselves.

To my parents, Charles and Serena, my quest to become a lifelong learner and the discipline to pursue all of my dreams I owe to you. I am the person I am today because of the way you raised me. You always taught me to work hard for what I wanted and I will always love you both for that.

To my brother Carl, who spurred a sibling rivalry between us when we were very young. Your love for perfection and passion in everything you did eventually rubbed off on me and catapulted me to where I am today.

To my parents-in-law, Doug and Marian, your love and support were paramount during this study. I will always be mindful of the times you spent listening to me, which is priceless.

Finally, I dedicate this work to God for the wisdom, knowledge, patience, and diligence He has bestowed upon me. Through Him, all things truly are possible.

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CHAPTER ONE: THE PROBLEM

Overview

School reform has swept across the nation, leaving school districts rethinking the organization of the high school day (Mutter, Chase, & Nichols, p. 27). The National Association of Secondary Schools Principals (NASSP; 2004) report *Breaking Ranks II*, is intended to guide administrators through the gauntlet of high-stakes change. It focused on three key strategies:

1. Collaborative leadership, professional learning communities, and the strategic use of data
2. Personalizing the school environment
3. Creating rigorous student-centered curriculum, instruction, and assessment

The NASSP (2004) maintains that high-performing schools are attainable when key stakeholders collaborate and focus on these strategies.

The world of primary and secondary education has witnessed a shift in scheduling models. Researchers have locked to the idea that longer blocks of instruction will better prepare high school students for the challenges of tomorrow (Canady & Rettig, 1995; Queen, 2000; Shortt & Thayer, 1998; Silva, 2007. The traditional schedule has been deemed by some ineffective, and administrators and educators are exploring new scheduling options (Carroll, 1990; Marshak, 1997; Rettig & Canady, 2001). Canady and Rettig (1995) estimated that more than 50% of high schools in America implemented or considered utilizing some form of an alternate schedule.

The implementation of any strategy is accompanied by the need for time and other resources. Gandara (2000) explains that school reform agents have spawned numerous studies on the relationship between learning and time — but few have investigated it as the primary element in change (p. 2). There is a difference that exists between instructional allotted time — how much time is provided for a course — and engaged time, when students are actually on task, and working (p. 3).

The focus of this study was time, in particular how the scheduling of the high school day influences the key stakeholders present. A major part of the 20th century school reform movement has been the restructuring of the school day into blocks (Canady & Rettig, 1995; Cawelti, 1994; Queen, 2000; Shortt & Thayer, 1997). Marshak (1997) asked the question, "How does one structure time for effective teaching and learning in block scheduling (p. 2)?" This question still eludes many experts today.

Problem Statement

No Child Left Behind (U.S. Department of Education, 2008) supports this nation's concept that every child can learn. In addition, there is an increased level of accountability for each state (Florida Department of Education, 2010). As a result, a move towards scientifically based teaching methods has swept the nation (Barba, 1995; Barnett, Goldsten, & Jackson, 1994; Swanson, 1999). This move includes the implementation of block scheduling for the secondary education school day (Balsimo, 2005; Forman, 2009; Mondi, 2009; Wisconsin Center for Educational Research, 2004). Even with some ranting about the success of block scheduling in Florida (Winans, 1996), the research regarding block scheduling has yielded mixed results (Zepeda & Mayers,

2006). This leads some school districts to support the traditional six-, seven-, or eight-period day schedule (Simon, 2009).

Teachers and administrators today are under tremendous pressure to help students meet or exceed rigorous national- and state-level academic standards (Robbins, Gregory, & Herndon, 2000, p. 20). For example, No Child Left Behind (2001) requires students to reach 100% proficiency level in math and reading by 2013–2014, so it is paramount that each school district implements a school schedule that is most conducive for the instructional methods and student learning styles present at a particular school.

One high school recently had a vote, and the results showed the faculty and staff divided on whether to move from traditional scheduling to block scheduling. Some experts contend that teachers need time to teach the curriculum as well as discipline plans and classroom procedures (Robbins, Gregory, & Herndon, 2000. Is block scheduling an appropriate choice for the high school? This study attempted to elucidate the effect block scheduling has on student achievement, discipline, and attendance.

Background of the Study

The National Education Association (NEA, 2008) purports that schools, teachers and students should all be held to high standards, and schools, education employees, policymakers, and parents — with the ultimate goal of helping every student succeed — should share accountability. The debate over how to structure the school day so that teachers and students can reach these high standards rages on. The traditional schedule of 50- or 60-minute classes was labeled as flawed in the National Education Commission on Time and Learning (1994) report, *Prisoners of Time.*

Over the past two decades, high schools have witnessed a move from traditional to block schedules. Some of this is credited to The National Commission on Excellence in Education (1984) researchers, who contended that high schools needed to use their time more efficiently. The move allowed for increased classroom instruction time (90 minutes), fewer classes students have to concentrate on daily, a decrease in the number of transitions between classes (benefits administration), fewer students teachers have to prepare for per semester, and a reduction in the amount of money spent by districts (Canady & Rettig, 1995; Dow & George, 1998; Nichols, 2005; Zepeda & Mayers, 2006).

The block schedule also allows time to address the academic standards related to standardized testing. The federal government joined in the high-stakes testing furor through the No Child Left Behind Act (2001), which includes a heavy annual testing component and tough penalties for schools that fail to boost scores (NEA, 2008). In particular, the Florida Comprehensive Achievement Test (FCAT), which is the latest version of Florida's statewide assessment program, predicated on the Florida Sunshine State Standards. Florida schools receive a report card annually, based on student performance and progress on various portions of the FCAT (see Appendix A). Even with the aforementioned benefits, some districts have made a decision to abandon block scheduling for various reasons.

A recent report by Simon (2009) posits that Reed-Custer School District cannot afford block scheduling any longer and will switch back to traditional scheduling for the following reasons: (a) to save money, (b) because of a lack of higher test scores, and (c) to address the short attention span of students. The report also cited the superintendent in strong opposition to block scheduling because of the lack of student homework, students

having different teachers throughout the year for the same subject, and reduced graduation requirements. Finally, by converting math, English, science, and social studies to yearlong classes, students receive more instructional time and can better prepare for college.

Kenney (2003) reported that Escambia School District in Brewton, Alabama returned to a traditional schedule after spending six years on a block schedule. The district superintendent, Melvin Powell, disclosed that wealthier districts could afford to utilize block scheduling, but Escambia County cannot. Some of the other issues Powell experienced with block scheduling included teachers not being able to teach for 93 minutes but rather assigning busy work, students subjected to long periods of time between sequential math classes, and students losing focus during the block due to their short attention spans.

Purpose of the Study

The purpose of this study was to determine the impact block scheduling has on (a) student academic achievement, discipline, and attendance, and (b) administrator, teacher, and student perceptions. Specifically, this study evaluated the 10^{th}-grade scores from the Florida Comprehensive Achievement Test, reading and mathematics sections. Archival data for discipline and attendance was retrieved from the Florida Department of Education and the school district. Perceptions were gathered from data obtained through individual interviews.

Research Questions

This study evaluated the potential impact block scheduling has on student achievement, discipline, and attendance at the high school level. Employing a mixed methods approach, past and current research was utilized as a springboard to answer the following two key questions, along with subquestions:

1. Is there a significant difference in FCAT reading and math scores, student attendance rates, and discipline referrals between students on an alternate-day block schedule and students on a seven-period traditional schedule?
    a. For the 2005–2010 school years, is there a significant difference in FCAT reading and math scores, student attendance rates, and discipline referrals between students on an alternate-day block schedule and students on a seven-period traditional schedule?
    b. For the 2010 school year, is there a significant difference in FCAT reading and math scores between students on an alternate-day block schedule and students on a seven-period traditional schedule?
    c. For the 2009 school year, is there a significant difference in FCAT reading and math scores between students on an alternate-day block schedule and students on a seven-period traditional schedule?
    d. For the 2008 school year, is there a significant difference in FCAT reading and math scores between students on an alternate-day block schedule and students on a seven-period traditional schedule?

e. For the 2007 school year, is there a significant difference in FCAT reading and math scores between students on an alternate-day block schedule and students on a seven-period traditional schedule?

f. For the 2006 school year, is there a significant difference in FCAT reading and math scores between students on an alternate-day block schedule and students on a seven-period traditional schedule?

g. For the 2005 school year, is there a significant difference in FCAT reading and math scores between students on an alternate-day block schedule and students on a seven-period traditional schedule?

2. What are the administrator, teacher, and student perceptions of the impact block scheduling has on student achievement, attendance, and discipline?

Theoretical Framework

The research used a mixed methods approach to examine the impact block scheduling has on student achievement, discipline, and attendance at the high school level. Social learning theory was the premise for this study, as it purports that people learn from one another during observations, imitations, and modeling (Bandura, 1977). Time management also undergirded this study, as effective use of time is paramount to increase student learning and achievement.

The findings of the study were shared with stakeholders interested in the academic achievement, discipline, and attendance of students who attended high school in Central Florida. In addition, present and future researchers will have access to the results of this study to further the body of knowledge in this area.

Limitations and Delimitations

The limitations of this study include the choice of participants, as they might be influenced by the study prompts or answer questions dishonestly. The sample size is small and may not be generalizable to a larger population. The location of the high schools is a rural area in Central Florida and is limited to high school administrators and teachers. The study may also include students that are on block scheduling for the first time and have experienced traditional scheduling in the past.

The delimitations that cause reliability or generalizability issues in the later results of this study include the restricted regional setting, the level of educational setting (high school only), the teaching and learning styles present in the classrooms of the participants (as they also can play a role in student achievement), discipline, and attendance.

Definitions of Terms

The following terms are used throughout this document and are defined for the purpose of this study:

A/B (Alternate-day) schedule: A teaching schedule where students and teachers meet their classes every other day for extended blocks of time (Canady & Rettig, 1995, p. 23).

ABC block schedule: A teaching schedule that organizes four days into 100-minute periods, and the fifth day is a traditional schedule. "A" days are Monday and Wednesday, "B" days are Tuesday and Thursday, and "C" days are on Friday (Marshak, 2001, p.4).

Block schedule: A teaching schedule that organizes at least a portion of the school day into larger blocks of time (e.g. more than 60 minutes) to allow greater flexibility for various instructional activities (Cawelti, 1994, p. 23).

Florida Comprehensive Achievement Test (FCAT): The Florida Comprehensive Achievement Test determines whether a 10th-grade student has adequately mastered reading and math content to graduate and receive a high school diploma. It consists of criterion-referenced tests (CRT) in mathematics, reading, science, and writing, which measure student progress toward meeting the Sunshine State Standards (SSS) benchmarks (FLDOE, 2010).

FCAT math and reading scores: The total score that a student can receive in Reading or Mathematics labeled the scale score and ranges from 100 to 500. These scores are accompanied by a level of 1 to 5. Level 3 is considered at grade level. The scale scores are indicators for this study.

Florida Department of Education (FLDOE): The state agency of education that governs public education and manages funding and testing for local educational agencies (school boards) within the state of Florida.

Florida school report card: Schools are assigned a grade based primarily upon student achievement data from the FCAT. School grades communicate to the public how well a school is performing relative to state standards. School grades are calculated based on annual learning gains of each student toward achievement of Sunshine State Standards, the progress of the lowest quartile of students, and the meeting of proficiency standards.

No Child Left Behind (NCLB): An act signed into law on January 8, 2002. This

Federal law affecting K–12 education was grounded in four principles: accountability for results, more choices for parents, greater local control and flexibility, and an emphasis on "doing what works" based upon scientific research (USDOE, 2008).

Semester (4x4) block schedule: Students enroll in and attend the same four 90-minute classes for 90 days. Student can complete eight classes within a year (Canady & Rettig, 1995).

Student attendance: There are 180 calendar days students are responsible to attend school. Any days missed are either excused or unexcused absences. Students must be in class when the bell rings, and if they miss more than 30 minutes of class, they are marked absent. Attendance rates, measured by unexcused absences, are indicators for this study.

Student discipline: This refers to the amount of administrative detentions, suspensions, and expulsions a student accrues. Any of these disciplinary actions are usually the result of a referral written by the teacher and followed up by the administrator. The amount of referrals written and suspensions are both indicators for this study.

Traditional schedule: A single-period daily school schedule composed of students participating in six, seven, or eight classes each day and varying in duration between 40 and 60 minutes (Canady & Rettig, 1995, p. 22).

Educational Significance

There is an increasing amount of research focused on the appropriate amount of class time for student achievement at the high school level (Stanley, Spradlin, & Plucker,

2007). Dow and George (1998) commented on a 1997 study, commissioned by the Florida Educational Research Council, which cited as many as 200 Florida schools utilizing a block schedule. Two of the three high schools in a Central Florida school district have incorporated the A/B block schedule, while the last has remained on a seven-period traditional schedule. Limited research has been conducted in Florida regarding the impact block scheduling has on student achievement, discipline, and attendance. In addition, several researchers indicate that student discipline and attendance can have an adverse affect on student achievement (Positive Behavioral Interventions and Supports, 2009; Scott & Barrett, 2004; Warren, 2006).

This study expanded upon the limited research on the impact of block scheduling in Florida high schools (Cosimano, 2004; Deuel, 1999; Martin-Carreras, 2006; McLeland, 2001). Research in this area usually examines a transition from traditional to block schedule or compares various schedule models. In particular, the study conducted by Cosimano (2004) compared three high schools implementing block schedules to two that utilized traditional schedules. The Cosimano findings supported prior research, which found that block scheduling might enhance student achievement levels in reading, writing, and mathematics. In addition, increasing student achievement, decreasing student behavior problems, and increasing student attendance rates were all a part of the alternative block scheduling findings.

Summary

A plethora of studies across the United States has focused on the effects of block scheduling on student achievement (Zepeda & Mayers, 2006). This is a direct result from

experts elucidating the weaknesses of the traditional schedule (Carroll, 1990; Canady & Rettig, 1995; Queen, 2003). Studies in Florida that included student achievement, discipline, or attendance are very limited (Buckman, King, & Ryan, 1995; Cosimano, 2004; Martin-Carreras, 2006). This study evaluated the effectiveness of block scheduling for student achievement, discipline, and attendance.

Chapter 1 sought to delineate the problem, provide some background, introduce research questions, and establish a framework for this study. Chapter 2 contains a review of literature, which focuses on the relationship of various scheduling models and student achievement, discipline, and attendance. Included are discussions on research studies on administrator, teacher, and student perceptions of traditional and block scheduling. Chapter 3 outlines the methodology for this study, which includes the research design, selection of subjects, assumptions, instrumentation, procedures, and data processing and analysis. Chapter 4 presents the research questions, an analysis of the quantitative and qualitative data, test and analysis of the hypotheses, and a summary of research findings. Chapter V offers a summary and conclusions for this study, implications for practice, and recommendations for the future.

CHAPTER TWO: LITERATURE REVIEW

Overview

This study evaluated the potential impact block scheduling has on student achievement, discipline, and attendance at the high school level. Scheduling at the high school level presents many challenges and options for school-level administrators. Canady and Rettig (1995) purport that these challenges, providing quality time, creating a positive school climate, and providing varying learning time, can be addressed with alternative scheduling. Although the use of block scheduling remains a controversial issue at the high school level (Slate & Jones, 2000), advocates contend that block scheduling can increase academic engagement, grade point averages, and graduation rates, and reduce absenteeism (Canady & Rettig, 1995; Queen, 2003; Winans, 1996). Others suggest that fewer classes and longer class periods may be a good enough reason to employ a block schedule (Calwetti, 1994; WCER, 2004).

The Florida Governor's A+ plan for Education (State of Florida, 2008) plays a major role in the decisions high school administrators and teachers make regarding student achievement. Based on three principles, (a) set high standards for student performance, (b) measure and publicly report on that performance, and (c) provide state assistance, rewards, and sanctions, schools are annually graded (A, B, C, D, or F) each year, based on performance and progress on the writing, reading, mathematics, and science portions of the FCAT. Monetary benefits are awarded to schools that continually show gains, and stiff penalties are given to those who do not. To that end, the decision to

move to or from a block schedule could be paramount, depending upon the impact it has on student achievement.

The impact block scheduling has on student academic achievement, student discipline, and student attendance at the high school level was the focus of this study. This review of relevant literature is composed of four sections, beginning with a comparison of various scheduling models. The consequent section includes an examination of studies predicated on student achievement, paying special attention to standardized test scores. Studies that investigated school climate, which includes student behavior and attendance, are discussed in the ensuing section. The final section concludes with the perceptions of administrators, teachers, and students who experienced block scheduling.

High School Scheduling Models

Traditional

At the high school level, a traditional schedule presents students with six, seven, or eight classes daily (Canady & Rettig, 1995). Each class period ranges from 40 to 60 minutes, and students attend the same classes for the entire year. Shown in Table 1 is the traditional schedule.

Traditional scheduling has its origins in the early 1900s, driven by the Carnegie Unit (Carnegie Foundation, 2002). Developed in 1906, this unit measured the amount of time a student had studied a subject. Students were obligated to complete 120 hours in one subject in order to earn one high school credit. Classes meetings occurred four to five times a week, 40 to 60 minutes, and 36 to 40 weeks each year. Fourteen units were

deemed to constitute the minimum amount of preparation that could be interpreted as four years of academic or high school preparation (Carnegie Foundation, 2002).

Past research boasts some benefits of traditional scheduling. Rettig and Canady (2001) reported that some faculty believe 50 to 60 minutes class length is a perfect amount of time, as two-thirds of the day is spent in core instruction. Teachers also have the same students for the year, and there is not a long segment of time in between sequential classes (e.g. Spanish 1 to Spanish 2). In addition, traditional schedule students outperformed block schedule students in math and science all year (Bateson, 1990; Gruber & Onwuegbuzie, 2001; Zepeda & Mayers, 2006). Faculty also reported that classroom management is an easier task because of the amount of time allotted (Zepeda & Mayers, 2006).

Table 1

Traditional Seven-Period Model

Period	Monday	Tuesday	Wednesday	Thursday	Friday
1	History	History	History	History	History
2	English	English	English	English	English
3	Phys. Ed.	Phys. Ed.	Phys. Ed.	Phys. Ed.	Phys. Ed.
4	French	French	French	French	French
5	Science	Science	Science	Science	Science
6	Math	Math	Math	Math	Math
7	Band	Band	Band	Band	Band

Canady and Rettig (1995) posit that the inherent problems associated with the traditional schedule include (a) exacerbating discipline problems, (b) lack of time with increased graduation requirements, (c) contributing to the impersonal nature of high schools, (d) hindering flexible time for teaching and learning, (e) limiting instructional possibilities for teachers, and (f) not fostering a user-friendly workplace for teachers. The authors are strong proponents for the 4 x 4 or accelerated block discussed in the ensuing section.

Four-by-Four or Accelerated Block

Over the past 20 years, block scheduling has been one of the fasting growing initiatives in high schools across America (Lewis, Dugan, Winokur, & Cobb, 2005). The first known attempt at block scheduling, credited to Trump, involved a flexible modular plan that included classes of varying lengths (Goldman, 1983). Flexible modular scheduling was a type of academic scheduling that broke classes down into many 10-20-minute modules, leaving students with several open or free times.

The demise of Trump's plan, due to ineffective instructional strategies and student discipline problems, spurred the creation of the Copernican Plan. Carroll's (1990) Copernican Plan, named after Copernicus, who offered new ways to explain already known facts, proposed a major restructuring of the high school schedule. The Copernican Plan fostered an increased amount of instructional time, fewer classes a student had to concentrate on, and a reduction in student movement around campus (Carroll, 1990).

Carroll (1994) posits that the Renaissance Program was the first Copernican pilot program, implemented in 1989 at Masconomet Regional High School in Boxford, Massachusetts. Students chose if they wanted to participate or remain on the traditional schedule. The schedule split the year into three trimesters of 60 days, with students taking two 100-minute classes each morning for a full trimester. In addition, morning classes met for a total of 118 hours in the second year of the program, which was still about 25% less time than the students on the traditional schedule (139 minutes). Students still earned full course credit and completed six morning classes (two each trimester) per year, and in the afternoon they could take traditionally scheduled electives and participate in a seminar program.

The most popular derivative of the Copernican-style structure found in U.S. high schools today is the 4 x 4 block or accelerated schedule (Canady & Rettig, 1995, p. 69). The 180-day school year is divided into two 90-day semesters, with the school day sectioned into four blocks that are usually 90 minutes in length (Bevevino, Snodgrass, Adams, & Dengel, 1999). The 4 x 4 block schedule is particularly beneficial for students at risk of school failure because the model allows students to focus on only four courses, fosters personal relationships with teachers, and provides opportunities for individualized attention (Queen & Isenhour, 1998). Illustrated in Table 2 is the 4 x 4 model.

Table 2

4 x 4 Block Schedule

	Semester	
Block	Fall	Spring
1	Math	Science
2	History	Spanish
3	Band	Band
4	Phys. Ed.	English

Compared to the traditional schedule, the block schedule offers several advantages. Queen (2003), and Wraga, Hlebowitsh, and Tanner (2000) offer the following:

1. Teachers utilizing a variety of instructional practices due to the 90-minute block
2. Teachers only teach three classes and plan during the fourth
3. Students only have to concentrate on four classes each semester
4. Shorter student transition times between classes
5. Students can take accelerated classes or repeat classes
6. Greater opportunity for special programs

Wyatt (1996) purports that staff development is paramount for effective instruction in block scheduling. Included in that staff development can be (a) various methods of sharing information (moving away from lecturing), (b) incorporating a variety of assessment methods (projects and portfolios), (c) how to utilize concept mapping, (d)

classroom management and organization strategies, and (e) integrating the curriculum (p. 268).

Since the time allotted in a block schedule is more and sometimes double a traditional schedule, Canady and Rettig (1995) contend teachers should incorporate three-part lesson plan designs: explanation, application, and synthesis. An instructional teaching model like cooperative learning should also be incorporated with the longer blocks of time (p. 211).

Alternating or Eight-Block

The alternating-day schedule, also known as the A/B block or eight-block schedule is another popular scheduling model high schools. Rettig and Canady (2003) teach us that students alternate between four classes daily and teachers are responsible for six classes for the year. Similar to the 4 x 4 semester block, class time is approximately 90 minutes, which allows for various instructional strategies. The alternating block schedule is presented in Table 3.

Table 3

Alternating Block Schedule

Day Block	1	2	3	4	5	6
1	History	Spanish	History	Spanish	History	Spanish
2	English	Phys. Ed.	English	Phys. Ed.	English	Phys. Ed.
3	Band	Science	Band	Science	Band	Science
4	Math	Band	Math	Band	Math	Band

Zepeda and Mayers (2000) warn about the potential pitfalls the alternating schedule can present. Teachers and students may wonder what day it is early on in the year, and rarely do teachers and students meet on consecutive days. In addition, there is little opportunity for acceleration or repetition of courses, and students are expected to master six to eight classes a year (p. 49). The benefits are similar to those of the 4 x 4 schedule:

1. Opportunity to plan and to implement extended lessons
2. Fewer passing periods
3. Opportunity to utilize varied teaching strategies
4. Increased instructional time (p. 49)

The authors contend that itinerant teachers can benefit from the alternating block as they can be assigned to one school on A days and a second school on B days (p. 49).

Thomas (2001) asserted that many schools on the block schedule bandwagon fell off because of failed promises of fewer disciplinary problems and higher student

academic performance (p. 74). In addition, there is a difference between the perception, which remained positive, and the reality of the studies, which cast a bit of doubt in the world of education (p. 75). For example, a Florida study showed 54% of students raised their grade point averages, while 45% lowered theirs (Buckman et al., 1995). A New York study witnessed students in traditionally scheduled schools outperform students on a block schedule on the state exams. The consequent section discusses past studies that focused on various scheduling models and student achievement at the high school level.

Student Achievement and the Various Scheduling Models

Researchers are constantly searching for ways to raise student achievement, and some entertain the idea of a longer school day or academic year (Gandara, 2000; Gullatt, 2006; Silva, 2007). Danielson (2002) purports that teacher collaboration and learning promotes student achievement (p. 44). Instructional strategies that promote student achievement include:

1. Summarizing and note taking
2. Assigning homework
3. Providing feedback and recognition
4. Fostering cooperative learning
5. Generating and testing hypotheses and questions
6. Setting objectives (Marzano, Pickering, & Pollock, 2001)

Student achievement is most often measured with standardized test scores (Danielson, 2002, p. 22). Despite the region, the research and literature regarding student achievement and various scheduling models present a mixed bag of results.

Southern Research

Wright (2010) evaluated the impact that 10 years on a traditional schedule and 10 years on a modified block had on student achievement. This longitudinal study took place in South Carolina. The graduation rate, SAT scores, Basic Skills Assessment Program (BSAP)/High School Assessment Program (HSAP) scores, changing demographics, and the voices of principals and veteran teachers from 25 years of data were analyzed. The SAT math and verbal mean scores showed an increase of nineteen points in math on the modified block schedule. The BSAP/ HSAP math and reading scores showed improvement of statistical significance during the traditional schedule years.

Contradictorily, Norton (2010) sought to determine if significant differences existed among South Carolina schools that employed a semester block schedule, an alternate A/B block schedule, or a single-period traditional schedule on school passage rates in English-language arts (ELA) and math as measured by the exit exam of the South Carolina High School Assessment Program (HSAP). After comparing English and Math passing rates for 131 schools utilizing various scheduling models, the results yielded no significant differences between the means. The author suggested continued professional development for teachers, which is supported by Forman (2009), Shortt and Thayer (1998), and Wyatt (1996).

In Florida doctoral studies, Martin-Carreras (2006) evaluated the effectiveness of block scheduling in Florida public high schools, while Cosimano (2004) examined the impact of block scheduling on academic achievement. Martin-Carreras (2009) measured academic achievement using the FCAT 9^{th}- and 10^{th}-grade math and reading scores,

Scholastic Reading Inventory Test for 9th–11th grade, the math end of course scores for 9th–11th grade, the English end of course scores for 9th–12th grade, and grade point averages. It was concluded that schedule design is not important in achievement as measured by the FCAT or the Scholastic Reading Inventory Test.

Palm Beach County was the setting for the Cosimano (2004) study, and the academic achievement for the five schools compared were under a 4 x 4 block schedule, A/B block schedule, two on the traditional schedule, and a modified block with traditional. 9th-grade FCAT Reading scores, Math Norm Referenced Test (NRT) scores, and 10th-grade FCAT Reading scores, Math Norm Referenced Test (NRT) scores, and FCAT writing scores were utilized to measure academic achievement.

Cosimano (2004) analyzed the means from the 2001 student academic achievement scores and found that significant differences existed. The 9th-grade scores from the school with the modified block schedule were higher than the 9th-grade scores from all the other schools, except for one of the traditional schedule schools. The same held true for the 10th-grade student achievement scores, as the same traditional schedule school outperformed all the other schools. Furthermore, the modified block schedule school, in comparison to the other two block schedule schools, achieved higher scores. This supports the findings of Oven (2004), where academic achievement was positively impacted by a modified block schedule because of increased instructional time with students.

Other recent studies by Deuel (1999) explored block and traditional scheduling in urban high schools. Ten high schools on block scheduling were contrasted with 13 high schools on a traditional schedule. The students at block scheduled schools earned more

A's and fewer C's, D's, and F's than those on a traditional schedule. In addition, the results indicated that advanced mathematics scores were higher at the schools on block scheduling, and on every academic measure derived from student records, lower scores were reported by the schools on a traditional schedule. Conversely, McLeland (2001) found that students on the traditional schedule recorded higher scores than those on a block schedule.

McLeland (2001) evaluated the relationship between block scheduling and academic achievement in a study that divided 10th-grade students by ethnicity, Black and White. The participants were from four southeastern Florida high schools. Achievement was measured using the math and reading FCAT scores. Furthermore, Black students on the traditional schedule had significantly higher FCAT reading scores than those on the block schedule. The author concluded that scheduling and ethnicity were significantly related to achievement as measured by the FCAT reading and math scores.

In a case study of the effectiveness of high school block scheduling in an urban school system, Reames (2009) examined whether the changed schedule resulted in an increase in test scores. Ten years of data was collected from the Georgia Department of Education. The results showed an upward trend for student scores on quantitative and verbal Scholastic Aptitude Test (SAT), Advanced Placement Test (AP) passing rate, and student scores on the state-mandated graduation examinations in the four subject areas of mathematics, language arts, science, and social studies. In contrast, Gruber and Onwuegbuzie (2001) examined the effects of block scheduling on academic achievement between 115 high school students who received instruction via a block schedule and 146 students who received instruction via a traditional schedule.

The Gruber and Onwuegbuzie (2001) study recorded statistically significant differences for language arts, mathematics, social studies, and science scores. The students on the traditional schedule received higher Georgia High School Graduation Test scores than those on a block schedule. However, this was not the case in a doctoral study that investigated the impact block and traditional scheduling had on student achievement. Brown-Edwards (2006) examined Georgia High School Graduation Test scores. The passing rates from the math, English, science, and social studies from 2003–2004 for the 172 Georgia high schools were compared and the results revealed no significant difference between any of these variables. In another Georgia study, Floyd (2009) investigated one high school's change in its scheduling format from a block schedule to a seven-period day. The instructional time in the classroom changed from 90-minute classes on the semester block schedule to 50-minute classes on the seven-period day schedule. The data revealed:

> The American Literature scores indicated that students performed the same on the block as well as on the traditional schedule. The type of academic schedule had no impact on the End of Course Test (EOCT) scores for American Literature. The data related to U.S. History indicated that students performed better on the block schedule than students on the traditional schedule. (p. 86)

Lawrence and McPherson (2000) also measured student academic achievement, but for North Carolina students on block and traditional schedules. Secondary students from two high schools in the southeastern region of North Carolina made up the population. Data analysis included a comparison of the two groups' means for each of the four subject areas using *t* tests. The results showed that mean scores for the end-of-the-year tests in Algebra 1, Biology, English 1, and U.S. History were significantly

higher for students taught on a traditional schedule than students on a block schedule. Furthermore, the results did not support the Carroll (1994) study of academic achievement that utilized final classroom grades, the findings of which supported block scheduling.

In a study that examined flexible scheduling in West Virginia, Cooper (1996) assessed the A/B schedule implemented at Morgantown High School. This was a part of an interactive collaboration with West Virginia University, and the decision to move to a block schedule was made after a yearlong teacher discussion and investigation of alternating schedules. ACT scores and Comprehensive Test of Basic Skills (CTBS) exams scores from 1990–1995 were used to measure and track student academic achievement.

The findings indicated the scores remained steady and close to the national average. In addition, the AP Chemistry scores that were already 10-to-15 percent above the national average also remained steady. Similarly, in a study commissioned by the Metropolitan Educational Research Consortium (MERC), statistical student and school performance data, as well as survey and interview data of administrators, teachers, and students were utilized to investigate and analyze the effect the schedule has on student performance and behavior (Pisapia & Westfall, 1997).

Student performance data was collected from 12 high schools in Virginia that utilized either a traditional six- or seven-period schedule or switched to an alternating block schedule or a semester block schedule. The data included Scholastic Achievement Test (SAT) scores, Test for Achievement and Performance (TAP) scores, and Advanced Placement Test (AP) scores. Arnold (2005) also examined the relationship between

student achievement and schedule type utilizing the Tests of Achievement and Proficiency (TAP). Virginia public high schools (grades 9–12) utilizing a seven-period traditional schedule or the A/B block schedule, were the setting for this study.

The Tests of Achievement and Proficiency (TAP) six subject areas evaluated were: (a) reading comprehension, (b) mathematics, (c) written expression, (d) using sources of information, (e) social studies, and, (f) science. The mean scores for these subject areas from 1991–1996 were compared and revealed increases the year implementing block scheduling, but most of those increases diminished by the second year. In addition, schools on a block schedule for their first year in 1996 outperformed schools that were on it for three or four years, and there was no statistical difference between the scores for the schools on either a block or traditional schedule.

In contrast, Pisapia and Westfall (1997) reported that TAP is a test of basic skills, and the results show that either of the alternative schedules did not majorly affect it. In addition, the verbal portion of the SAT experienced the most positive impact from the alternative schedule. Conversely, math scores did not benefit from the same schedule. Although students in the alternating block experienced smaller gains in their overall GPA than those in the semester block, they did produce greater increases in SAT scores. The core subjects affected most by the semester block schedule were science and English, as these student grades increased significantly more than the students in the alternating block.

In an article focused on block scheduling in Florida high schools, Dow and George (1998) discuss how student achievement has been affected by this new scheduling strategy. For example, Flagler-Palm Coast High School moved from a

traditional seven-period schedule to four 85-minute classes. Some of the benefits cited by the staff included the grade point averages for all students increased, the number of students that made the honor roll rose from 27% to 55%, dual enrollment numbers soared at the local community, and students can accelerate and take more higher level math classes. When educators across Florida on a block schedule were polled, the results were similar and indicated 65% reported increased honor roll numbers, 55% reported increased enrollment in electives, and 50% reported increased GPA (Dow & George, 1998, p. 104).

Northern Research

Forman (2009) examined the impact semester block scheduling had on student achievement in Massachusetts. After analyzing data of 762 North Reading High School 10th-grade students passing the Massachusetts Comprehensive Assessment System exam, the results showed a 15% increase in mean scores on the required subject tests. Other schools who switched to block scheduling did not perform as well, mainly due to lack of professional development for teachers and staff.

North Reading High School brought in clinicians to familiarize teachers with effective teaching techniques for block classes. Forman (2009) also recommended keeping a close eye on this change to monitor the sustainability of the results in years to come, supporting earlier findings of Gainey and Brucato (1999), Khazzaka (1998), Queen, Algozzine, and Eaddy (1998), Queen and Gaskey (1997), and Shortt and Thayer (1998).

In Connecticut, Andrews (2003) assessed the effects of block scheduling on student performance on the 2001 AP Calculus AB, AP English Literature; Composition,

and AP U.S. History tests and on the 2001 Connecticut Academic Performance Test (CAPT). Twenty-four Connecticut high schools (12 block and 12 traditional) were chosen for the study. The results indicated the type of schedule did not affect student performance on AP Calculus AB, AP English Literature & Composition, and AP U.S. History tests, and A/B block scheduling was associated with higher student performance on the CAPT. From the findings, it can be surmised that on the CAPT, student performance may even improve in conjunction with the adoption of block scheduling. These results endorse earlier findings by Cooper (1996), Evans, Tokarczyk, Rice, and McCray (2002), Khazzaka (1998), and Lare, Jablonski, and Salvaterra (2002).

Evans, Tokarczyk, Rice, and McCray (2002) investigated the impact block scheduling had on three school districts in Pennsylvania. They compared the data from schools two years after implementation and concluded:

> Overall, the percentage of students on the honor roll increased at the three sites by 9 percent (from 22 percent to 31 percent). The number of students on high honor roll, or principal's honor roll, increased from approximately 6 percent to 9 percent. The percentage of students receiving a single D or F for a final course grade decreased by 7 percent (from 29 percent to 22 percent). There was also a decrease in the number of students experiencing multiple failures, from 8 percent to 5 percent, in spite of the fact that most students completed eight courses instead of the traditional seven. (p. 321)

In additional studies in Pennsylvania, Lare, Jablonski, and Salvaterra (2002) examined one school district's attempt to answer the question of whether block scheduling is cost-effective and the effectiveness of block scheduling on student achievement. The purpose of their case study was to evaluate the semester block scheduling that has been in place for nearly a decade in one particular high school. The multi-method evaluation included the following:

- Teacher, student, and parent surveys

- Focus groups
- Interviews
- Classroom observations
- Archival records

The findings indicated a significant increase of students on the A honor roll, students on the B honor roll stayed the same, percentages passing the AP exams remained the same, and PSAT mean verbal scores increased.

In a study that produced similar results, Khazzaka (1998) investigated student cognitive achievement at schools that transitioned from traditional to block scheduling. Two schools from small cities and four schools from four small, rural communities were chosen because they were the first in the region to convert. The overall student population at the start of the data collection process was 2,890. Data collection included the mean GPA for students, which revealed 53% improved grades with the block schedule. Other findings consisted of the number of A's increased by 12% for 9th-graders and for AP classes, students completed 20% more classes, and the average ACT score rose from 19 to 22.5.

Midwestern Research

In a quantitative, causal-comparative study, Adrian (2009) examined the extent to which 4 x 4 block scheduling influenced at-risk student achievement at one northern Illinois high school. The results revealed at-risk students on a block schedule experienced significantly higher cumulative core subject GPAs compared to at-risk students on a traditional school schedule. This is consistent with research that advocates

that block scheduling fosters increases in student achievement (Evans et al., 2002; Khazzaka, 1998; Lare et al., 2002, and Wraga et al., 2000). Contradictorily, on-time graduation rates were not statistically different between students on a traditional schedule and students on a block schedule.

Nichols (2005) measured the impact block scheduling had on English and language arts students. The data collected included grade point averages from five Indiana high schools in a large metropolitan area. The schools converted either to a semester block or to a block eight scheduling format, designed to influence student achievement and success. The findings produced little evidence that the conversion to block scheduling formats would significantly affect student achievement in the specific English-content area. Also in Indiana, Veal and Schreiber (1999) examined the impact three different schedules (traditional, 4 x 4 block, and hybrid) had on student achievement.

The study took place at South Springfield High School, where student achievement was measured by the Indiana Test of Basic Skills. The traditional schedule—55-minute classes for a year—produced students that scored significantly higher on mathematics computation, than the 4 x 4 block and hybrid schedules. As for the areas of reading and language, the schedule type did not affect student scores positively or negatively. It was concluded that the block format does very little for conceptual learning and mathematics achievement. Supporting these findings was a study that took place in Minnesota, where Balsimo (2005) examined the effects of scheduling on student achievement in a study that documented a suburban high school's move from a traditional schedule to a block schedule.

The data analyzed for this study included student grade point averages, ACT test scores, and Advanced Placement scores from a nine-year period. The findings revealed that block scheduling did not have a significant impact on any of the student achievement indicators. In addition, Whitfield (1999) examined student achievement in a study of an Iowa high school that transitioned to an alternate-day, four-period block schedule. The data collected consisted of 417 senior grade point averages, and the Tests of Achievement and Proficiency (TAP). Research designs included a series of *t* tests, analysis of covariance, and a multiple regression analysis.

Findings indicated student achievement as measured by senior year grade point average is statistically significant and positively correlated to performance on the TAP, but a traditional schedule or an alternate-day block schedule did not affect student achievement as measured by senior year grade point average. Contradictorily, in a longitudinal study of an Ohio high school, Trenta and Newman (2002) measured the relationship between block scheduling and academic achievement.

The academic indicators used were:

1. Student cumulative grade point average (GPA)
2. Grades in math, science, English, and social studies
3. ACT scores
4. The Ohio Proficiency Test (OPT).

The data revealed a significant positive relationship in terms of the four academic subject areas, but students did not do significantly better or worse in terms of cumulative GPA, ACT scores, or the OPT. The results are somewhat supported by Hess, Wronkovich, and Robinson (1999), who examined student achievement in Ohio. Results from their

study showed that the results from English and biology tests did produce a statistical difference that favored block scheduling.

The Hess et al. (1999) population consisted of the sophomore class at Coventry High School. Retired copies of the Scholastic Achievement Test (SAT) subject area tests were administered in a pre-test and post-test fashion. In addition to the aforementioned results, student performance on the geometry and history tests produced no statistically significant differences based on the school schedule, which supports research conducted by Floyd (2009), Nichols (2005), Veal and Schreiber (1999), and Whitfield (1999).

Nationwide Research

Zepeda and Mayers (2006) analyzed 58 empirical studies of high school block scheduling presented by the following groups: (a) teachers' instructional practices and perceptions of block scheduling, (b) change and block scheduling, (c) effects of implementing block scheduling, (d) effects of scheduling on student learning, and (e) students' perception of block scheduling. The findings revealed an increase in student grade point averages due to block scheduling; however, the data on standardized test scores was inconsistent. It was also discovered that key information was often omitted and many studies reported data that were collected over short periods.

In a study that explored the association between high school scheduling plans and college science preparation, Dexter, Tai, and Sadler (2006) examined introductory college science grades. They also compared frequencies of instructional practices in traditional- and block-scheduled high school science classes. Participants were students enrolled in introductory college biology, chemistry, and physics. The findings revealed

(a) that the various schedules had similar frequencies of instructional practices, (b) student grades differed slightly across the scheduling plans, and (c) the AB block students were associated with the lowest grades. Dexter et al. concluded that block scheduling might put students at a disadvantage in terms of preparation for college science.

Block scheduling and student performance on AP exams was the focus of the Smith and Camara (1998) research report. The design of this study included an examination of two years' worth of data concerning the impact of scheduling changes on AP courses. Information collected from questionnaires, telephone surveys, and at teacher workshops and open forums suggested that schools utilized a traditional schedule with sessions of 30 to 60 minutes, an alternating schedule with sessions of 61 to 90 minutes, or fall and spring block scheduling. The data revealed that the most frequent schedule under which students completed AP classes was the traditional, followed by the alternating schedule, and then the semester block schedule.

Smith and Camara (1998) reported on the statistics analyzed, which included student grades from AP U.S. History, AP English Literature, AP Biology, and AP Calculus AB, and student AP data from 1997 matched with the PSAT/NMSQT administered in 1995 or 1996. The PSAT/NMSQT functioned as a covariate to ensure that any differences in student performance across the various instructional schedules are primarily related to the schedule and not to existing differences in the ability level of students in a specific schedule (Smith & Camara, 1998, p. 2).

The findings depicted the following:

1. Student grades on three out of four AP Examinations in the study were affected by the instructional schedules

2. Higher grades were recorded in AP Biology and AP Calculus AB in the year-long extended blocks of time
3. In AP U.S. History more recent instructional affected the scores (spring versus fall)
4. The recency of the instruction and the length of the class did not significantly influence AP English Literature grades (Smith & Camara, 1998, p. 9).

Bateson (1990) investigated the effects of full-credit semester and all-year timetables on science attitudes and science achievement of 10th grade students British Columbia. Data collected included background information, affective scores, and cognitive scores, which were used to compare the groups. The findings indicated that 10th-grade students in yearlong science classes significantly outperformed the students who took science in the first semester or second semester, contrary to reported teacher perceptions of semester versus all-year courses. In addition, second-semester students out-performed the first-semester students, which supported the conclusion that retention can be an issue associated with block scheduling.

Block Scheduling and School Climate

Research has shown that school climate makes a difference in improving learning opportunities (Buckman et al., 1995; Positive Behavioral Interventions and Supports, 2009; Sergiovanni and Starratt, 1993). Some experts feel that rewards and awards are necessary to promote high standards in learning and behavior (Barba, 1995; PBIS, 2009; Warren, 2006; Wolk, 2002). Sergiovanni and Starratt (1995) defined school climate as:

> The enduring characteristics that describe the psychological character of the particular school distinguish it from other schools and influence the behavior of

> teachers and students . . . the psychological feel that teachers and students have for the school. (p. 82)

Tableman (2004) posits "school climate reflects the physical and psychological aspects of the school that are more susceptible to change and that provide the preconditions necessary for teaching and learning to take place" (p. 2).

Qualities such as openness, trust, communication, and support shared by teachers are factors that encourage learning for students and job satisfaction and improved performance for teachers (Buckman et al., 1995). Schools with a positive learning climate value and uphold the norms of collegiality among the people (administrators, teachers, students, and parents) who compromise the school community (Zepeda & Mayers, 2000, p. 22). Several aspects of a school's physical and social environment comprise its climate (Tableman, 2004, p. 2). Alliance for the Study of School Climate (2008) identified eight areas:

1. Appearance and physical plant
2. Faculty relations
3. Student interactions
4. Leadership/decision making
5. Disciplined environment
6. Learning environment
7. Attitude and culture
8. School-community relations

Two major components within the disciplined and learning environments—that may be more challenging with longer blocks of class time—are classroom management and student motivation.

Classroom management deals with "how teachers structure their classrooms, the implicit and explicit rules and expectations, and their philosophies of teaching and learning" (Wolk, 2002, p. 3). In addition, school should be more than teaching kids reading, writing, math, and science skills, but making behavior, character, morality, and social justice a part of the curriculum as well (p. 7). Jones and Jones (2007) contend that the greatest concern of new teachers was their inability to deal with aberrant behavior and diverse needs of some students (p. 7).

Student motivation depends on the teacher, students in the class, and classroom environment, as an event impacts the people around it, and people learn from one another (Bandura, 1977). Marshak (2001) purports the following regarding student motivation:

> It is essential to provide clear instructions, to develop students' pride in their program, also identify explicit student behavior expectations, listen to student concerns, and finally connect lessons and units to what students perceive as the real world of their lives. (p. 142)

Self-efficacy plays a major role in student motivation, which is "beliefs in one's capabilities to organize and execute the courses of action needed to produce given attainments" (Bandura, 1997, p. 3). Similar to student achievement, the research concerning school climate and block scheduling yields mixed results.

In Virginia, Brown (2006) examined the attitudes and perceptions of special education teachers on the impact block scheduling had on students with high-incidence disabilities. This doctoral study took a glimpse at the academic and social development of a public high school with an enrollment of 1,629 students. At the time of the study there were 15 special education teachers providing services for 244 students. The researcher analyzed archival school data, which included dropout and suspension statistics from 1996–1997 (traditional schedule) to 1997–2000 (block schedule). The

data revealed a slight increase in the number of reported special education students who dropped out of school and a substantial increase in the number of suspensions each year after the implementation of block scheduling. These findings conflict with earlier results of Shortt and Thayer (1998), Queen, Algozzine, and Eaddy (1998), and Queen and Gaskey (1997) as they support the notion that block scheduling can help reduce dropout and suspensions rates.

Balsimo (2005) investigated the effects of block scheduling on student discipline, attendance, retention, and dropout rates. This nine-year longitudinal study assembled data from the school district, which revealed that for the two school years of traditional scheduling, the average number of discipline referrals per student was 1.505, while the average number of discipline referrals during the seven school years under the block schedule was 1.467. The author noted that this was not a statistically significant difference. Moreover, the comparison between the traditional- and block-scheduled years for the average percentage of students present, the retention rates, and the dropout rates illustrated that there was no significant differences in any of those categories.

The data presented by Balsimo (2005) to support these claims include that the average percentage of students present under the seven years of block scheduling was 93.1%, and for the two school years of traditional scheduling the average percentage of students present was 91.1%. As far as the retention rates were concerned (students who graduated in four years), under block scheduling they averaged 95.6%, and under the traditional schedule averaged 93.5%. In addition, the percentage of annual retention (students who finished one school year) was 86.0% under block scheduling and 79.5%under traditional scheduling. Finally, the data concerning the dropout rates

illustrated a decrease from 7.9% to 5.6% when block scheduling was implemented. Cosimano (2004) found similar results in a South Florida study that investigated the absentee and suspension rates for three schools under a 4 x 4, A/B, and modified block schedule with traditional classes.

Data was collected for 1996 and 2001 from Palm Beach County and analyzed in order to gauge a barometer for increases or decreases in school rates. The schools utilizing block scheduling in 1996 reported a significant decrease in absentee rates. The school under the A/B schedule witnessed an absentee rate decrease of 30% when compared to the district rate, and a rate decrease of 50% was recorded for the school under the 4 x 4 schedule in comparison to the district. The only school in 2001 to benefit from a decrease in their absentee rate was the A/B school; which was 20% lower in comparison to the district.

The suspension rates were comprised of in-school and out-of-school data, and showed very little change for the schools that were compared to the district. The A/B school witnessed the largest drop in 1996, 33% for in-school suspensions, while the 4 x 4 school did not decrease in-school suspensions and recorded a 17% decrease in out-of-school suspensions when compared to the district. However, in 2001 the school under the 4 x 4 schedule reported a 25% decrease in suspension rates compared to the district, while the A/B school witnessed an increase of 8% over the district average. Overall, the block-scheduled schools rates were consistently lower than the district average, which supports earlier findings of Queen, Algozzine, and Eaddy (1998), Queen and Gaskey (1997), and Shortt and Thayer (1998), as all contended that discipline problems and absentee rates diminish with block scheduling.

Other studies also examined both the positive and negative impact block scheduling can have on school climate. Griffin and Nicholson (2002) compared archival data for students from two high schools in Mississippi from 1996–1997, when a traditional schedule was utilized, to that of block-scheduled 2000–2001. The 2000–2001 seniors from Cleveland High School (CHS) and East High School (EHS) were the first class to experience the block schedule throughout their entire high school education. Two of the questions addressed during this study focused on the trends in discipline problems, absentee rate, and dropout rate after the implementation of the block schedule. Although the data from CHS showed a decrease of in-school suspensions, it showed that out-of-school suspensions increased. The data for EHS showed increases in both in-school and out-of-school suspensions. In addition, the average daily attendance rates for both schools seemed to remain steady, and they both experienced a reduction in dropout rates.

Gainey and Brucato (1999) shared that teacher and student attendance tends to improve in schools that adopted a block schedule. These claims come with some speculation, but the positive lift in school climate stem from student indications such as:

- They like the schedule better
- The day seems to go by quicker
- There is less stress
- They cannot miss class because the work is too much to make up (p. 107).

Khazzaka (1998) found similar results after analyzing the records of six secondary schools that made the switch from a traditional to a block schedule.

The study examined the effects block scheduling had on student achievement, attendance, and discipline. The positive trends that were realized because of moving to a block scheduling included (a) daily attendance rose from 75% to 88.5%, (b) truancy decreased by 4%, (c) infractions related to violent behavior decreased by 45.5%, and referrals for class disruption or insubordination dropped by 57%. Supporting these results was a commentary of a 1997 study commissioned by the Florida Educational Research Council.

Dow and George (1998) discuss the outcomes of Florida schools that utilize a block schedule. Although some school leaders felt that one year was not enough time to cite the pros and cons of a new scheduling strategy, other educators contributed to the following positive research regarding school climate:

- 63% reported a reduction in discipline referrals
- 60% reported more positive teacher-student relationships
- 98% reported new and innovative teaching techniques

Negative trends were cited for the past two aforementioned studies, which included an increase in tardiness by 17% (Khazzaka, 1998), and 20% of the schools reported lower dropout rates and smoother transitions from middle to high school (Dow & George, 1998).

A Missouri study of administrator and teacher perceptions was the focus of paper by Stader and DeSpain (1999). Schools with fewer than 500 students that had implemented some form of block scheduling during or before 1996 were qualified to participate in this study. Questionnaires were completed by 62 administrators and 152

teachers and focused on student achievement, school climate, and teaching methodology. The researcher utilized seven descriptors to assess the school climate:

1. Teacher-student relationship
2. Teacher and student daily attendance
3. Level of stress
4. Frequency of hallway disruptions
5. Class size
6. Types and frequency of discipline referrals
7. If the school day was more hectic (p. 6)

The findings support earlier assertions made by Gainey and Brucato (1999), Khazzaka (1998), Queen and Gaskey (1997), and Shortt and Thayer (1998), which illustrated that block scheduling can make the school day less hectic, reduce the frequency of and severity of discipline referrals, has a positive impact on the teacher-student relationship, and reduced teacher stress.

Shortt and Thayer (1998) examined the relationship between block scheduling and school climate. After analyzing a Virginia Department of Education survey, Virginia high school principals and teachers reported (a) a more relaxed environment, (b) a reduction in student-unsupervised movement, (c) less discipline referrals delivered to the office, (d) fewer student fights, (e) a positive effect on teacher attendance and morale, and (f) a positive impact on at-risk youth. The authors concluded that the emphasis on staff development at the school level increased as well as differentiated instruction predicated on student needs.

In additional studies Queen, Algozzine, and Eaddy (1998) evaluated the implementation of block scheduling at three high schools in Lincoln County, North Carolina. Their findings reported teachers were spending 70% of their instructional time engaging students interactively. In the area of discipline problems, teachers expressed slight differences, as they used less than 15% of their time managing discipline problems. Similar results were reported in the Huntington Beach Study, Staunton (1997) reported that teachers and students were more relaxed on block days, partly due to the extra time. In terms of school management, a reduction in disruptions, interruptions, and delays were all witnessed, however the issues of decreasing classroom interruptions and less wasted time under the block scheduling were not strongly supported.

Queen and Gaskey (1997) purport that when block scheduling is used; school climate improves because there are fewer incidents of disruption and more time for quality instruction. The schools utilizing a block schedule reported the following:

1. Reduction in absenteeism
2. Lower incidents of violence
3. Decline in the number of discipline problems
4. Varied instructional methods

The overall school atmosphere was less frenzied in block scheduled schools than in traditional scheduled schools because students changed classes less frequently. The authors recommend a training program in classroom management for beginning or any teacher who struggles with student discipline because of the longer block of time. These recommendations are consistent with the findings of Forman (2009), and Shortt and

Thayer (1998), who investigated schools that switched to block scheduling and contended that professional development is paramount for successful implementation.

Pisapia and Westfall (1997) reported on a study of 12 Virginia high schools that focused on the effect alternative scheduling had on student attendance, dropout rates, and discipline. These indicators of school climate were measured by Average Daily Attendance (ADA) and dropout rates provided by the Virginia Department of Education, and the number of discipline referrals, suspensions, and expulsions from every school. Mixed results for the nine schools that experienced a schedule change included increased attendance for two schools, three schools' attendance rates dropped, and the remaining four schools attendance stayed the same.

Furthermore, the dropout rates for the schools were inconsistent because three schools on alternating block decreased, two remained the same, and the rates for two schools increased. Although the schedules did not affect the number of more serious discipline infractions such as weapons violations or drugs, the number of referrals and suspensions reduced at every school, undergirding the future research of Canady and Rettig (1995), Deuel (1999), Griffin and Nicholson (2002), and Shortt and Thayer (1998).

Perceptions of Administrators, Teachers, and Students on Block Scheduling

Administrator Perception

In a study that garnered the perceptions of 15 administrators from Florida schools, Cosimano (2004) measured the impact of alternative scheduling on student academic achievement. Selected administrators were under a 4 x 4 block, A/B block, and a

modified block schedule schools in Palm Beach County. After administering an agreement response questionnaire that consisted of 30, 5-point Likert-type prompts, the results were analyzed using a one-way analysis of variance (ANOVA). The ANOVA revealed that the following four items proved significant: (a) remaining on the block schedule, (b) block scheduling is cost effective, (c) class size decreased, and (d) number of graduates going to college. The Lare et al. (2002) study also deemed block scheduling an effective tool for student achievement as well as being cost-effective.

Cosimano (2004) reported an administrator perception that concluded there was no need to schedule classes over two semesters because they felt students had no problem with content retention. However, the author cautions that with a small amount of administrators participating, the viewpoint obtained is one of the limitations for this study. Similarly, Griffin and Nicholson (2002) evaluated the effect block scheduling had on two high schools in the Cleveland, Mississippi School District. The perceptions of three administrators who were present prior to and during the implementation process were gathered using surveys that consisted of 10 items, and produced concerns about the loss of instructional hours and the lack of significant improvement in student achievement.

Administrators did perceive a decrease in discipline problems, and cited that most stem from inadequate classroom management techniques or poor planning. The Mifflin County School District assessed the effects of block scheduling with gifted secondary students and boasted similar results. Bugaj (1999) reports that the areas of administration (school district controlled items), teaching (teacher controlled items), and compliance (district adhering to the standards set by Pennsylvania) were measured by the perceptions

of administrators and teachers. Questionnaires were mailed to 10 Pennsylvanian school districts, and of the 76 respondents, eight were administrators.

The results from the questionnaires, comprised of 20 Likert-type questions and one open-ended question, revealed an administrator perception of the block schedule being superior to the traditional schedule in every category measured. Furthermore, the findings indicate that district controlled planning and programming items were the most positively impacted by the block scheduling. Comparable results were found in a paper that reported on a Missouri study. Stader and DeSpain (1999) commented on the perception 62 principals from small high schools that implemented block scheduling. Questionnaires that focused on the effects of block scheduling on student achievement, school climate, and teacher methodology were administered. The results revealed that administrators perceived student achievement improved under the block along with the quality of student work, depth of subject matter covered, enrollment in advanced placement courses, and student retention of material.

Various findings supported the findings such as Bugaj (1999), Cosimano (2004), Hamdy and Urich (1998), Khazzaka (1998), and Wyatt (1996). Conversely, the administrators felt that the amount of homework assigned to students decreased. In another study that gathered the perception of administrators, Hackmann (1999) examined scheduling trends in Iowa by sending surveys out and phone calling high school principals. The results showed that the traditional eight-period daily schedule was the most utilized in 1998–1999. For the schools experimenting with a block schedule, the principal perception was that it provided increased course choices for students. The

trends for some Iowa high schools are to double block classes within a traditional schedule, or meet in a block format once or twice a week.

The surveys and phone interviews revealed the following reasons some principals considered and rejected block scheduling:

1. Arts and music programs were highly touted
2. Inconclusive evidence regarding student achievement and block scheduling
3. Faculty resisted predicated on specific instructional issues
4. Scheduling modifications were not supported by current staffing arrangements

The attitude of one principal toward block scheduling was that Iowa high schools have to focus on developing standards and benchmarks for reading, mathematics, and sciences; after that we can discuss the best type of schedule (Hackmann, 1999). Similarly, Deuel (1999) evaluated the perceptions of teachers, staff, and administrators in Broward County high schools. It was discovered that block-scheduling models are perceived as successful by faculty and staff.

The findings depicted that the majority of teachers reported they increased the number of learning activities, implemented a variety of new teaching techniques, provided more individualized attention, and experimented with different student evaluation techniques. In addition, a substantial proportion of counselors concurred that students have time to do more in-depth study, do better concentrating on fewer subjects, are able to pursue the electives that interest them, and have been able to enroll in the classes needed to graduate on time. The administrators perceived block scheduling as fostering fewer chances for student misconduct and afforded teachers and students the opportunity to focus on fewer subjects, with deeper learning.

Leadership and professional development opportunities for staff were cited by administrators, as being paramount for the successful implementation of a block schedule (p.24), concurring with the prior research of Gainey and Brucato (1999), Khazzaka (1998), Queen, Algozzine, and Eaddy (1998), Queen and Gaskey (1997), and Shortt and Thayer (1998). Additional studies by Hamdy and Urich (1998) and Khazzaka (1998) both illustrate an administrator perception of complete support for the block schedule.

Hamdy and Urich (1998) utilized a survey and interviews to gather attitudes from 69 secondary principals. The survey instrument was a Likert-type questionnaire consisting of 26 items, which also asked for demographics and type of schedule being utilized. Results revealed (a) a modified block schedule best addresses the needs of certain academic courses, (b) preparing for block scheduling includes professional development for innovative teaching in extended times and new student schedules, (c) student-centered instruction requires additional instructional strategies and resources, and (d) 9^{th} and 10^{th} grade students should be allotted more time to adjust to the block schedule.

Khazzaka (1998) captured the perception of 22 administrators who worked under both the traditional and block schedule. A survey, which included open-ended questions that measured opinions of the move to a block schedule from the traditional schedule, was utilized to gather the following regarding the administrator perception:

1. Students were enabled to earn more credits
2. Atmosphere was more relaxed
3. Increased academic success
4. Teachers were enabled to utilize a variety of instructional strategies

5. Decreased student infractions
6. Increased attitude towards school (parents, students, faculty, and staff)

Conversely, administrators viewed the fact that teachers needed more training and scheduling issues existed with AP and elective classes as the negative aspects of a block schedule.

Teacher Perception

Several past studies conducted by Raines (2010), Allen (2009), and Mondi (2009) have captured the attitudes of teachers concerning the block schedule. Raines (2010) investigated two high schools on a block schedule, and two high schools on a traditional schedule utilizing a teacher survey. A major theme emerged that more time was needed to design lessons to meet the needs of their students, when functioning on a block schedule. Similarly, in Southwest Minnesota, Allen (2009) administered surveys to assemble the perceptions of 12 math teachers, seven male and five female, with experience teaching on both schedules.

The findings concluded that although teachers found benefits with both schedules, they preferred to teach math under the traditional schedule. A better opportunity to cover curricula goals, student difficulty paying attention in longer blocks of time, a lack of training for the block schedule, and the ability to cover more content support the teacher preference for traditional scheduling. Finally, in a quasi-study, Mondi (2009) examined personal reflections from novice and veteran teachers (n= 44) on a block schedule. The teachers' perceptions were derived from their responses to the prompt, "write your candid feelings about teaching on a block schedule." The majority of teachers felt the following:

1. Block classes were too long to keep students' attention
2. Undertrained to teach in the block
3. Some sense of anxiety with the extra time
4. Many students do not possess the independent study skills necessary to be successful.

Mondi (2009) recommends paying special attention to pre-service activities and offering systematic support for new teachers, mainly from administrators, department chairs, and mentors. These results mirror the research conducted by both Raines (2010) and Allen (2009), who found that teachers required more time planning on a block schedule, a higher degree of professional development for teachers is beneficial, and teachers feel that students struggle with the extra time in class.

Shanahan (2006) investigated teachers' perceptions of the effectiveness of block scheduling in seven key areas: staff development, curriculum, teaching methods, students class work, student achievement, school climate, and satisfaction. Demographics taken into consideration were responsibility, years of teaching at this school, years in education, highest level of educational degree attained, type of student schedule used prior to block scheduling, the time at which block scheduling was implemented at this school, and size of the school. Teachers' perceptions of the effectiveness of block scheduling differed significantly in the (a) curriculum areas taught, (b) years of experience that teachers had at the school when a block schedule was implemented, and (c) size of the school.

In a doctoral study that examined special education teachers' perceptions of block scheduling for students with high incidence disabilities, Brown (2006) concluded:

- Block scheduling afforded students more time to complete assignments

- Delved more deeply into lessons
- Improved student and teacher relationships
- Increased teaching techniques for teachers.

On the other hand, special education teachers agreed (a) block scheduling made it difficult for students to stay focused for a 90-minute block, (b) exacerbated the pressure placed on students to perform at a faster pace, and (c) significantly reduced students' socialization in the school setting.

Rikard and Banville (2005) garnered the perceptions of 15 high school physical education teachers of their experience teaching on a block schedule compared to the traditional schedule. Individual interviews were conducted at eight southeastern high schools to gather teacher views. The data collected from the interviews was divided into the following four categories: (a) planning, (b) instruction, (c) learning environment, and (d) student learning. Teachers reported a limited variety of teaching strategies in blocked classes and the use of several class transitions during their 90–95 minute lessons. Consistent with previous research findings, the teacher perception indicated reduced stress levels, a decline in student absenteeism and tardiness, reduced student behavior problems, and sense of a stronger teacher-student relationship (Khazzaka, 1998; Queen, Algozzine, & Eaddy, 1998; Rettig & Canady, 2001). Although they had no documented evidence for this conclusion, 66% of teachers perceived that students learned more in blocked versus traditional classes.

The Palm Beach County School District was the setting for a study conducted by Cosimano (2004) that measured the impact of block scheduling on the perceptions of teachers. A teacher questionnaire was utilized to solicit feelings pertaining to the

schedule the participants were working under; 4 x 4, A/B, or modified block. Similarities discovered during the analysis of the data revealed three interrelated themes:

1. Teachers believed that staying on the block would benefit the students because of the demonstrated progress made by teachers and students.
2. Teachers sensed that students could achieve higher scores academically and grew their ability to master subjects, because of the teachers' progress.
3. Teachers considered that the extra planning time and instructional time allowed them to improve their teaching strategies and the quality of their lesson plans, which led to stronger curriculum delivery.

Mondi (2009) does not support these findings, as teachers felt ill-prepared for the block schedule and thought that students were not able to handle additional time in classes.

In a casual-comparative study, Jenkins, Queen, and Algozzine (2001) evaluated North Carolina teachers' responses to a survey. Only schools that operated on a block or a traditional schedule participated. The questionnaire was divided into three sections (a) level of use for specific instructional practices, (b) level of appropriateness for using specific instructional strategies, and (c) level of training on specific instructional strategies. Both groups reported similar levels, which resulted in no differences in teacher views or instructional techniques. Also in North Carolina, in a four-year study of teacher, student, and parent perceptions, Queen, Algozzine, and Eaddy (1998) reported that 70% to 80% of participants believed that block scheduling was worth continuing. In addition, 84% of teachers perceived block scheduling to have increased school safety. The majority of students and parents in the study perceived student discipline improved by nearly 40%.

Bottge, Gugerty, Serlin, and Suk Moon (2003) also investigated the effect block scheduling had on students with and without disabilities and the teacher perception. Teachers shared the following:

1. Satisfied with their jobs and school schedule
2. Spent about the same time on instructional activities
3. Confident on meeting the needs of students with disabilities
4. Collaborated with special education and general education teachers about the same amount of time

The authors suggest that developing and training teachers in more effective instructional methods can increase the effectiveness of block scheduling in relationship to student achievement (p. 11).

In another study that examined the perceptions of special educators on alternate schedules, Santos and Rettig (1999) utilized semi-structured interviews. The participants were 18 special education department chairs in Virginia high schools, nine on a 4 x 4 schedule, and nine on the AB schedule. The overall teacher perception was that the scheduling of students into general education classes remained unchanged. Teachers on the 4 x 4 schedule also felt that student course choice increased, believed a newfound flexibility for resource scheduling was established, collaboration increased, and teacher-student relationships improved with daily contact. The attributes perceived by the AB scheduled teachers were confusion as to what day it is, increased co-teaching with general education teachers, improved student behavior, and increased flexibility in scheduling.

In a study that compared teacher opinions regarding their preparation utilizing instructional strategies, Jenkins, Queen, and Algozzine (2002) surveyed 2000 high school teachers on a block or traditional schedule. North Carolina high schools that utilized a block schedule for three full years were compared to similar traditional high schools. Participants were asked to indicate their level of use of specific instructional strategies using a four-point Likert-type scale. Teacher perception indicated that the length of a block schedule compared to the shorter traditional schedule had little impact on the variety of instructional approaches.

Griffin and Nicholson (2002) examined a block schedule in effect at two Mississippi high schools. Surveys were administered to teachers employed prior to and throughout the implementation of the block schedule. The findings from the 15 surveys collected indicated that the block schedule allows more time to cover the curriculum; however, there were concerns about the scope of the curriculum covered. In addition, the teacher attitude regarding block scheduling is that it embraces student-centered learning, allows for more student-teacher individual time, and limits the coursework students have to concentrate on to four classes.

In an investigation of teachers' perceptions after implementing block scheduling, Evans et al. (2002) reported teachers could cover concepts more in depth, and this made teaching more interesting and challenging. Teachers also could spend more time working with individual students, and had fewer papers to grade. The study also revealed that teachers found it more difficult to prepare for a substitute. Stokes and Wilson (2000) investigated the perceptions of high school teachers regarding the effectiveness of block scheduling. The data collected included teacher perceptions after the first and second

year of implementation of the block schedule compared with their perception after the third and fourth year. This longitudinal study took place at four high schools and the variables included initial perception, subject area taught, and years of teaching experience. Teachers cited greater opportunities for students to gain credits toward graduation, increased planning time, and greater expectations for student achievement as reasons for deeming block scheduling more effective.

Similarly, Khazzaka (1998) administered 93 teachers a 15-item survey that garnered their opinions regarding their experiences teaching on a block schedule in comparison to a traditional schedule. The results depicted that teachers enjoyed the new schedule, reported less inappropriate student behavior, participated more in school related-activities, and felt less stressed, which mirror the findings of Rikard and Banville (2005). Accompanying and contradicting those findings were the negative aspects teachers felt were associated with block scheduling. Students were leaving campus during the school day, small classes that did not suit some instructional strategies, difficult time for students to make up work, and inadequate professional development on additional instructional methods, and difficulty scheduling AP and elective classes (p. 94). In addition, these findings are shared and supported by Mondi (2009), who discovered that block scheduling can be challenging for novice and veteran teachers.

Bugaj (1999) reported on the Mifflin County School District study that measured the impact alternative scheduling had on students labeled as gifted. Questionnaires were used to garner the perception of 68 Pennsylvania teachers who taught under an intensive schedule. After a statistical analysis of the 20 Likert-type questions on the questionnaire, the researcher concluded that teachers rated intensive scheduling higher than

conventional scheduling in the areas of administration, teaching, and compliance. Furthermore, out of the 25 responses recorded for an open-ended question, there were six positive and six negative perceptions towards intensive scheduling, with the majority remaining neutral on the subject.

A study of the perceptions of small Missouri high school teachers was the focus of a paper by Stader and DeSpain (1999). The research was predicated on the notion that the effects of block scheduling on student achievement, school climate, and teacher methodology can be measured. Participants included 152 teachers who completed questionnaires, resulting in a sundry teacher attitude that a block schedule may improve student achievement, teacher-student relationship, and teacher methodology. Math, science, physical education, and fine arts teachers did not find a decrease in D and F grades, nor an increase in A or B grades. However, English and social studies teachers confirmed the biggest decrease in D and F grades while witnessing a significant increase in A and B grades. In addition, all teachers perceived lesson planning to be more difficult on the block, but the variety of teaching strategies utilized and the opportunity to individually help students both increased.

Benton-Kupper (1999), in a qualitative multiple case study, explored the experiences of three high school English teachers in their second year of transition from a traditional schedule to a block schedule. The data collection process included classroom observations, collection of documents, and interviews. Variety of instructional strategies and depth of content taught were the two themes that emerged. The teacher perception was that the block schedule allowed them to provide more depth of content within their classrooms through in-depth materials, discussions, and projects and more opportunities

for instructional strategies that actively engage the student in learning. Similarly, Cooper (1996) examined the perceptions of science teachers after implementing an AB schedule. The results depicted the following advantages:

- Opportunity for imaginative teacher planning with the extended time
- Time for cooperative learning groups that allow for discovery learning
- Teachers can develop an entire idea in one sitting rather than dribble it out in several consecutive installments
- Instead of exams with only multiple choice questions they can feature essays (p. 203).

The author concluded that lab activities that last longer than two hours and math-science collaboration as benefits as well.

The length of time may also play a key role in findings, as the first years of block scheduling can be rigorous and teachers may not cover all the material (Shortt & Thayer, 1997). Zepeda and Mayers (2001) explored the challenges and experiences that come with a block schedule of first-year teachers from the Midwest. Purposeful sampling, which consisted of teachers who graduated from an accredited teacher program within three months, was utilized to select three urban school districts. The qualitative data collection methods consisted of interviews and field notes, and revealed new teachers had difficulty managing class time, varying instruction throughout the block, finding material or activities to last the period, transitioning learning activities, assessing student progress, and keeping students motivated and on task. Suggestions for the future included peer coaching and mentoring sessions, classroom observations, and traditional in-services.

In a study on the efficacy of block scheduling, Staunton (1997) investigated teacher beliefs. Huntington Beach Union teachers participated in a survey that addressed difference in (a) instructional practices, (b) assessment techniques, (c) social interaction, (d) curriculum, and (e) school management. The results portrayed a teacher perception of a block schedule as being:

- A facilitator of new instructional strategies and attempts to deliver content differently
- Encourager of new assessment methods
- Fostering of personalization in the classroom
- Positive for the coverage of curriculum; less material, but in detail
- Beneficial for the climate of the school.

Student Perception

Allen (2009) examined the perceptions of math students in Southwest Minnesota after moving from a traditional to a 4 x 4 block. The student survey provided mixed results as students were divided on whether they preferred block scheduling, whether they received higher grades, and whether they had more time to prepare for tests. Similar to Corley (2003), the author concluded that the student perception of the 4 x 4 block was it allotted time to get homework done in class, master more math concepts, get into cooperative learning groups, and have more individual teacher attention.

Utilizing a mix method, quasi-experimental design, Biesinger, Crippen, and Muis (2008) investigated the effects of an alternating block schedule model on student self-efficacy, attitude, and instructional practices within the context of mathematics. The

participants chosen for this study were mainly 10th-grade students from three treatment schools and one comparison school. Of the 242 students chosen for this study, 118 experienced the alternating schedule, and 124 remained on the traditional schedule. A revised version of the Fennema-Sherman Attitude Scale was utilized, pre- and post-test, to gauge changes in attitudes towards mathematics. The researchers constructed and administered a 12-item mathematics self-efficacy survey, formed a focus group of randomly selected students by grade level, and incorporated a revised version of a formal classroom observation instrument to observe a random sample of classrooms. The results yielded more positive attitudes from the treatment schools, and more negative attitudes towards mathematics at the traditional school; however, the effect size was small. Since the block schedule students showed more negative attitudes towards mathematics prior to the treatment, the author questions whether the results could be replicated with any success.

In a follow-up to previous block scheduling studies that took place in southwestern Ohio, Corley (2003) explored the perceptions of students. In 2002, English classes were administered 25-item surveys that utilized a 1–5 Likert-scale response scheme. The items dealt with the teaching methods the students' teachers were utilizing (14 items) and the perceptions and attitudes regarding block scheduling (11 items). The majority of students perceived the following about block scheduling based on descriptive statistics:

1. More time to learn concepts
2. More opportunities to work with other students
3. More time to prepare for tests

4. More total learning time
5. More time to complete homework in class
6. Better grades (p. 5).

In regards to the teaching methods, students agreed that they very often had assignments or seat work; they often received a lecture, worked in a group, had individual projects, and 2-3 activities per class; and rarely took field trips or completed four or more activities in a class.

Similarly, Griffin and Nicholson (2002) also investigated the perceptions students had of their experience with block scheduling. The participants for this study were 90 students in English class at Cleveland High School. The mixed findings from a seven-item student survey produced the following student perception: (a) teachers are using varied student-centered instruction methods, (b) easy or hard classes are too long and boring, (c) doing better in school because only focused on four classes a semester, and (d) more time for group work and to complete assignments.

The transition of ninth graders to block periods was the focus of a study that took place at Shorewood High School in Seattle. Marshak (2001) elucidated the reasons behind the research conducted as being "teachers wanted to address the issue of high failure rate for the first semester and too many ninth graders performing below their potential" (p. 3). Teachers conducted student surveys and focus groups to garner the student perception of the newly implemented ABC block schedule and to investigate how they could better help their students adapt. After analyzing the findings, the indication given was that overall students love the 100-minute periods, feel they can learn and do

more, think the lecture from teachers should be shorter, want breaks because the class can get boring, and say having an agenda on the board each day helps (p. 13).

Veal and Flinders (2001) ascertained teacher, student, and parent perceptions to determine how a various scheduling models influenced classroom practice. High school students were divided into three groups and followed a traditional six-period schedule, 4 x 4 block, or a hybrid of the traditional and block schedules. The data collection process included surveys, interviews, classroom observations, and text data. According to the block and hybrid teachers and students, the variety of instructional practices increased, in particular lab and group activities. Hybrid teachers also noted an increase in anxiety due to increased pace of instruction and a lack of planning time. Similar to the Allen (2009) study, students on the block schedule reported that individual help from their teachers increased. In addition, teachers on the block schedule cited an improvement in student-teacher relationship, attributed to working with fewer students and having longer class periods.

In a study of a Midwest high school on an alternative schedule, Marchant and Paulson (2001) explored how student perception is affected by different student profiles. The participants were 2,191 middle- to upper-class suburban high school students who represented 72% of the total population. Reports of their grades, satisfaction with their achievement, attributions of success to effort or ability, attributions of achievement to scheduling, and attitudes toward school were utilized to identify five academic profiles of students. A 27-statement student questionnaire that recorded responses using a five-point, Likert-type scale was the primary source of data. Combined with data from several student focus groups the findings revealed that the students who were average or high

achievers, and were satisfied with their grades, had the highest levels of school functioning and were most supportive of block scheduling. In contrast, the low-achieving students had the lowest perception of school functioning and lowest support for block scheduling.

Slate and Jones (2000) documented the reactions of high school students following a one-week period during which a 4 x 4 schedule was implemented. Participants were 1,205 high school students (586 boys; 609 girls). This number represented a 57% sample of the approximately 2,100 students enrolled in the school at the time of the study. Students had a slight preference for traditional scheduling, even though they reported many more advantages than disadvantages to block scheduling. The strongest preference for traditional scheduling was the seniors, girls, and African Americans. Seniors were the only subgroup that believed block scheduling was an unacceptable alternative to traditional scheduling.

In a study that garnered the perceptions of Virginia high school students, Pisapia and Westfall (1997) examined the impact alternative block schedules and semester block schedules had on student performance and discipline. The data collection process included student surveys and focus group interviews. Findings revealed that students in the alternating block schedule (a) perceived that skipping class was easier, so more students skipped, (b) felt it was harder to make up missed work, (c) thought teachers were more in-depth, (d) gave them more time to learn, conversely, some thought retention was a problem because of the day in between classes. The semester block students felt they learned more and better, because of only four classes to concentrate on, student discipline depended more on the teacher than the schedule, and the school day was calmer.

Western Branch High School had their block schedule evaluated during the first year of implementation to measure positive and negative impacts. Mutter, Chase, and Nichols (1997) cited the positive as students, parents, teachers, and administrators preferred the block to traditional schedule, students earned more credits, student grades and attendance improved, referrals decreased, and teachers had fewer students each semester (p. 31). The negative aspects included that students found it hard to recover from absences, teachers felt AP and music classes were hard to teach in one semester, students felt the lunches were too short, and parents, students, and teachers perceived the days ended too late. This supports the findings of Khazzaka (1998), as 549 students that attended a traditional and a block schedule responded to surveys. Consisting of 12 items, the results confirmed the perception of students as supporting block scheduling because of more time to do homework and for hands-on activities. Conversely, they felt the lunch period was too short and were concerned about the scheduling of AP and elective classes.

Hurley (1997) examined the perceptions of students in the block schedule. Western North Carolina was the setting for this study, which investigated five high schools' transition to a 4 x 4 schedule. After conducting open-ended interviews with 37 students, some of the positive comments consisted of:

1. More time to do homework and less of it
2. Changing teachers each semester is good
3. More time for lab and group work
4. An option of early graduation
5. Opportunity to participate in school-sponsored clubs during school.

In contrast, the negative aspects included (a) sitting time in class was too long, (b) some teachers only lectured, (c) uneven schedules that were too easy or too hard during a semester, (c) making up absences was more difficult, (d) some teachers tried to cover too much material in one day, and (e) retention issues because of possible yearlong breaks in between math or foreign language courses. Moreover, the author recommends asking students if they want a heavy or light schedule, use extended class periods to help students who were absent, and investigate the flexibility in the duration of classes.

Summary

Educational reform has been a staple of this nation's growth, and manipulating time within the high school day metamorphoses the traditional schedule into the block schedule. Reports such as *A Nation at Risk* (National Commission on Excellence in Education, 1984), *Prisoners of Time* (National Education Commission on Time and Learning, 1994), and *Breaking Ranks II* (NASSP, 2004) all placed education at the top of this nation's agenda and suggested that high schools needed to use the time allotted to them more effectively. The review of literature provided a fair amount of advantages for block scheduling:

1. Teachers have fewer preparations and more planning time
2. Teachers have fewer students per semester
3. Administrators notice an improvement in discipline and decrease in dropout rates
4. Students have a chance to retake failed classes
5. Students can earn more credits toward graduation
6. Students experience fewer transitions between classes.

The literature review also presented a decent number of problems associated with block scheduling such as: (a) longer class time is not conducive for the majority of students' attention spans, (b) student retention is adversely affected by the long gaps of time in between sequential classes, (c) math, science, and foreign language academic achievement may suffer, (d) students get less instructional time in a class annually when compared to the traditional schedule, (e) students that take an AP class in the fall semester do not take the exam until the spring, and (f) making up missed days is an arduous task for most students.

The plethora of detailed reports focused on the scheduling of time in high schools is staggering; however, when summarized, produce an ambiguous viewpoint. While research and data involving student achievement in Florida high schools continues to grow, the areas that are lacking are student discipline and attendance. In addition, there is a need for a study that focuses on a block schedule's effect, and not a transition from another schedule. On a positive note, *Education Week's* (2010) annual report card awarded Florida an overall grade of B-, which earned them a ranking of #8. Does the fact that the majority of schools in Florida rely on a block schedule confer any advances in student achievement? Chapter 3 presents detailed information regarding the methodology used in this project.

CHAPTER THREE: METHODOLOGY

Overview

Since the literature regarding block scheduling and student achievement yields mixed results, further research is needed to investigate the effect it has at the high school level. The purpose of this study was to examine the impact A/B block scheduling has on (a) student achievement, discipline, and attendance, and (b) teacher, administrator, and student perceptions during 2005–2010.

The examination of student data involved a detailed analysis of FCAT reading and math scores, attendance rates, and discipline referrals from 2005–2010. FCAT scores were obtained from the district office, and analyzed using a two-way analysis of variance. Discipline and attendance information was gathered from the district office as well as from the high school. Individuals' face-to-face, email, or phone interviews were conducted to collect the perceptions of teachers, administrators, and students present in 2005–2010. Participation was voluntary and formal letters notified eligible candidates of this study.

This chapter is divided into six sections. Section one defines the research design. The selection of subjects is explained in section two. Section three outlines the instrumentation utilized to collect and analyze data. Basic assumptions are discussed in

section four. Section five elucidates the procedures for this study. Data processing and analysis are presented in section six.

Research Design

A mixed method, quasi-experimental design was used to determine if A/B block scheduling has a significant impact on student achievement, attendance, and discipline. The rationale for selecting this design was that (a) the study groups will not be randomly assigned, and (b) a mix methods approach can capture the best of both quantitative and qualitative methods (Creswell, 2003, p. 22). This study employed a two-way analysis of variance to compare 10th-grade FCAT math and reading mean scores of students on a A/B block schedule to students on a seven-period traditional schedule from 2005–2010. The rationale for using this specific research design was based upon the Gravetter and Wallnau (2005) postulation that "the ANOVA is an extremely flexible technique that is used to evaluate the significance of mean difference in situations where there are more than two sample means being compared" (p. 370).

The following quantitative and qualitative research questions and subquestions will drive this study:

1. Is there a significant difference in FCAT reading and math scores, student attendance rates, and discipline referrals between students on an alternate-day block schedule and students on a seven-period traditional schedule?
    a. For the 2005–2010 school years, is there a significant difference in FCAT reading and math scores, student attendance rates, and

discipline referrals between students on an alternate-day block schedule and students on a seven-period traditional schedule?

b. For the 2010 school year, is there a significant difference in FCAT reading and math scores between students on an alternate-day block schedule and students on a seven-period traditional schedule?

c. For the 2009 school year, is there a significant difference in FCAT reading and math scores between students on an alternate-day block schedule and students on a seven-period traditional schedule?

d. For the 2008 school year, is there a significant difference in FCAT reading and math scores between students on an alternate-day block schedule and students on a seven-period traditional schedule?

e. For the 2007 school year, is there a significant difference in FCAT reading and math scores between students on an alternate-day block schedule and students on a seven-period traditional schedule?

f. For the 2006 school year, is there a significant difference in FCAT reading and math scores between students on an alternate-day block schedule and students on a seven-period traditional schedule?

g. For the 2005 school year, is there a significant difference in FCAT reading and math scores between students on an alternate-day block schedule and students on a seven-period traditional schedule?

2. What are the administrator, teacher, and student perceptions of the impact block scheduling has on student achievement, attendance, and discipline?

Selection of Subjects

The setting for this study was a school district located in Central Florida. There are three high schools, four middle schools, nine elementary schools located in the county. The ethnic demographics for this region are 72.3% White, 8.8% Black, 16.2% Hispanic, 1.3% Asian, 0.5% American Indian, and 1% multiracial.

Since this study took place at two of the three high schools located in this Central Florida School District, the cohorts of students represented diverse ethnicities, and came from urban, suburban, and rural backgrounds. The ethnic breakdown for the 1,022 students on the traditional seven-period schedule for 2009–2010 was 40.4% White, 31% Black, 26% Hispanic, and 2.7% Asian, American Indian, or multiracial. Economically disadvantaged students make up 63% of the population, and 16% of students have disabilities. The diverse population for the 799 students on the A/B block schedule for 2009–2010 consisted of 54% White, 31% Hispanic, 13% Black, and 3% are classified as multiracial. The majority of students (59%) are categorized as economically disadvantaged, and student with disabilities make up 14% of their population.

The participants for this study were students who (a) were 10^{th} graders at the selected high schools during 2005–2010, and (b) have a valid score for the FCAT reading and math portion of the test. Students whose scores were disqualified, or only took one portion of the test, will not have their data recorded.

Instrumentation

The quantitative section of the study compared high school students from 2005–2010:

1. FCAT reading and math mean scores
2. Attendance rates
3. Number of discipline referrals.

Similar to McLeland (2001), a two-way analysis of variance will be utilized to determine whether differences in the dependent variables (e.g., FCAT math & reading scores, amount of discipline referrals & suspensions) can be attributed to an independent variable (block or traditional scheduling). PHStat2 was utilized to make the necessary calculations.

The Florida Department of Education (FLDOE, 2010) offers a brief history of the FCAT:

- In 1976, the Florida Legislature enacted a new accountability act that moved the statewide assessment tests to grades 3, 5, 8, and 11. The Legislature also authorized the nation's first required high school graduation test, which subsequently was implemented in October 1977.
- The concept of a required graduation test was controversial, and the State went through a series of legal challenges culminating in the landmark federal case known as Debra P. v. Turlington. This was a broad-based attack on all aspects of the graduation test, and ultimately, the State prevailed.
- The FCAT was designed to meet both the requirements of the Comprehensive Assessment Design and the rigorous content defined by the Sunshine State Standards. The FCAT measures the content specified within the strands, standards, and benchmarks of the Sunshine State Standards and does so in the context of real-world applications. Initially, the FCAT was designed to assess reading, writing, and mathematics at four grade levels so that each subject was assessed at all levels of

> schooling: elementary, middle, and high. With legislative approval of Governor Bush's A+ Plan in 1999, the FCAT was expanded to include grades 3-10. In 2001, achievement for all grade levels was reported for the first time. The FCAT became the test required for high school graduation for the class of 2003.

The 10th-grade FCAT math and reading exams are administered in the spring and are required to receive a standard high school diploma. Both tests are predicated on benchmarks found in the Sunshine State Standards. Students receive a scale score ranging from 100 (lowest) to 500 (highest), with 300 being acceptable for graduation. Mean scale scores are used for the purpose of this project.

The qualitative section of the study involved conducting individual interviews. A purposeful sample including two administrators, five teachers, and five students were asked to participate. Participation was voluntary and consisted of answering a series of open-ended questions, which solicited the participant perception on the impact block scheduling has on student achievement, discipline, and attendance.

Assumptions

1. It is assumed that the archival data of FCAT scores, discipline referrals, and attendance records will be accurate and valid.
2. It is assumed that the FCAT math and reading sections are reliable instruments to measure student achievement.
3. It is assumed that the participants during the interviews will answer the questions honestly and sincerely.

Procedures

Permission to conduct this study was obtained from the Institutional Review Board. In addition, the school district's Assistant Superintendent and Director of Secondary Programs were contacted to gain permission. This researcher solicited administrator and teacher participation via email, and student participation via permission slips. All archival data was obtained from the Florida Department of Education and the school district.

Data Processing and Analysis

Statistical analyses were performed on the test groups—10th-grade FCAT reading and math scores, attendance rates, and discipline referrals for the 2005–2010 school years. A two-way analysis of variance was applied to determine if the differences in the dependent variables can be attributed to the independent variables. Descriptive data included the mean FCAT math and reading scores, attendance rates, and discipline referrals.

Hypotheses

The following hypotheses were utilized to execute this study:

Hypothesis 1_A states that a comparison of students on the A/B block schedule to students on the seven-period traditional schedule will produce no significant difference in 2005–2010 FCAT reading and math scores, student attendance rates, and discipline referrals.

Alternate Hypothesis 1_A states that a comparison of students on the A/B block schedule to students on the seven-period traditional schedule will produce a significant

difference in 2005–2010 FCAT reading and math scores, student attendance rates, and discipline referrals.

Hypothesis 2_A states that a comparison of students on the A/B block schedule to students on the seven-period traditional schedule will produce no significant difference in 2010 FCAT reading and math scores.

Alternate Hypothesis 2_A states that a comparison of students on the A/B block schedule to students on the seven-period traditional schedule will produce a significant difference in 2010 FCAT reading and math scores.

Hypothesis 3_A states that a comparison of students on the A/B block schedule to students on the seven-period traditional schedule will produce no significant difference in 2009 FCAT reading and math scores.

Alternate Hypothesis 3_A states that a comparison of students on the A/B block schedule to students on the seven-period traditional schedule will produce a significant difference in 2009 FCAT reading and math scores.

Hypothesis 4_A states that a comparison of students on the A/B block schedule to students on the seven-period traditional schedule will produce no significant difference in 2008 FCAT reading and math scores.

Alternate Hypothesis 4_A states that a comparison of students on the A/B block schedule to students on the seven-period traditional schedule will produce a significant difference in 2008 FCAT reading and math scores.

Hypothesis 5_A states that a comparison of students on the A/B block schedule to students on the seven-period traditional schedule will produce no significant difference in 2007 FCAT reading and math scores.

Alternate Hypothesis 5_A states that a comparison of students on the A/B block schedule to students on the seven-period traditional schedule will produce a significant difference in 2007 FCAT reading and math scores.

Hypothesis 6_A states that a comparison of students on the A/B block schedule to students on the seven-period traditional schedule will produce no significant difference in 2006 FCAT reading and math scores.

Alternate Hypothesis 6_A states that a comparison of students on the A/B block schedule to students on the seven-period traditional schedule will produce a significant difference in 2006 FCAT reading and math scores.

Hypothesis 7_A states that a comparison of students on the A/B block schedule to students on the seven-period traditional schedule will produce no significant difference in 2005 FCAT reading and math scores.

Alternate Hypothesis 7_A states that a comparison of students on the A/B block schedule to students on the seven-period traditional schedule will produce a significant difference in 2005 FCAT reading and math scores.

Summary

The purpose of this mixed method, quasi-experimental design was to determine if A/B block scheduling has a significant impact on student achievement, attendance, and discipline. To ascertain whether A/B block scheduling positively or negatively affects various indicators; FCAT scores, attendance records, and discipline referrals were examined. In order to preserve confidentiality, all identifying participant data was removed, and destroyed at the completion of the study.

In conclusion, Chapter 3 described the research design, selection of subjects, instrumentation, assumptions, procedures, data processing, and analysis for this study. Also explained were the research questions and hypotheses for this study. Chapter 4 presents the analysis of data and findings in respect to the research questions. Chapter 5 will conclude with a summary of the study and recommendations for future actions.

CHAPTER FOUR: FINDINGS

Overview

The purpose of this study was to determine the impact block scheduling had on (a) student academic achievement, discipline, and attendance, and (b) administrator, teacher, and student perceptions. More specifically, it studied whether a significant difference existed between two high schools in Florida, one utilizing the A/B block schedule and the other on a traditional seven-period schedule. The instruments for data collection and analysis for this study included the Florida Comprehensive Achievement Test, school district attendance and discipline archival data, and responses from individual interview questions. All data collected for this study remained anonymous, and was retrieved from school district personnel and the Florida Department of Education. PHStat2 was utilized to compute the necessary calculations.

This study addressed the following quantitative and qualitative research questions:

1. Is there a significant difference in 2005–2010 FCAT reading and math scores, student attendance rates, and discipline referrals between students on an alternate day block schedule and students on a seven-period traditional schedule?
2. What are the administrator, teacher, and student perceptions of the impact A/B block scheduling has on student achievement, attendance, and discipline?

Quantitative Data Presentation and Analysis

Analysis of Research Question 1

Is there a significant difference in 2005–2010 FCAT reading and math scores, student attendance rates, and discipline referrals between students on an alternate-day block schedule and students on a seven-period traditional schedule? Seven hypotheses were created and tested in order to investigate the first research question.

Hypothesis 1_A

A comparison of students on the A/B block schedule to students on the seven-period traditional schedule will produce no significant difference in 2005–2010 FCAT reading and math scores, student attendance rates, and discipline referrals.

To analyze the first hypothesis of the study, means were calculated for FCAT reading and math scores, attendance rates, and discipline referrals from 2005–2010. The means and standard deviations for students on the A/B block and traditional schedule are displayed in Tables 4, 5, 6, and 7.

Table 4 illustrates that students under the A/B block schedule averaged slightly higher FCAT reading scores from 2005–2010 than students under the traditional schedule. The means listed in Table 5 show a slight advantage in 2005–2010 FCAT math scores for traditional-scheduled students. Table 6 illustrates students under the A/B block schedule averaged a faintly higher attendance rate 2005–2010. In Table 7, the data indicates that students under the traditional schedule averaged more discipline referrals 2005–2010.

Table 4

Descriptors of 2005–2010 FCAT Reading Scores by Schedule

School	*n*	Mean	SD
A/B Block	1091	294	5.68
Traditional	1429	291	6.89

Note: Reading FCAT test scores range from 100 to 500.

Table 5

Descriptors of 2005–2010 FCAT Math Scores by Schedule

School	*n*	Mean	SD
A/B Block	1086	323	4.13
Traditional	1423	326	3.33

Note: Math FCAT Scores range from 100 to 500.

Table 6

Descriptors of 2005–2010 Attendance Rates by Schedule

School	*n*	Mean	SD
A/B Block	4546	83.65%	1.40
Traditional	6245	82.5%	1.23

Table 7

Descriptors of 2005–2010 Discipline Referrals by Schedule

School	*n*	Mean	SD
A/B Block	4546	1695	100.08
Traditional	6245	1956	332.63

A 2 X 4 repeated measures ANOVA was performed to examine the differences between students on the A/B block and traditional schedule with respect to FCAT scores, attendance rates, and discipline referrals. The independent variables were the A/B block and traditional schedules. The dependent variables were 2005–2010 reading and math FCAT scores, attendance rates, and discipline referrals.

In Table 8, the results from the two-way ANOVA are illustrated. Analysis revealed no significant main effect of scheduling type at the .05 level. The results of the ANOVA revealed a significant interaction. As a result, the hypothesis was rejected.

Table 8

Two-Way ANOVA Results for 2005–2010 Reading and Math FCAT Scores, Attendance Rates, and Discipline Referrals for A/B Block and Traditional Students

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*Fcrit*
Rows	4509004.779	4	1127251.195	165.056	0.000	6.388
Columns	6752.20225	1	6752.20225	0.988	0.376	7.7086
Error	27317.959	4	6829.48975			
Total	4543074.94	9				

Hypothesis 2_A

A comparison of students on the A/B block schedule to students on the seven-period traditional schedule will produce no significant difference in 2010 FCAT reading and math scores.

To analyze the second hypothesis of the study, means were calculated for 2010 FCAT reading and math scores. The means and standard deviations for students on the A/B block and traditional schedule are displayed in Tables 9. The data displays a higher mean reading score for students on the A/B block, and a higher mean math score for students on the traditional schedule during 2010.

Table 9

Descriptors of 2010 FCAT Reading and Math Scores by Schedule

	Traditional Schedule		A/B Block Schedule	
Test	FCAT Reading	FCAT Math	FCAT Reading	FCAT Math
n	195	193	151	176
Mean	291	331	296	321
SD	48.55	48.35	50.25	50.32

A 2 X 2 repeated measures ANOVA was performed to examine the differences between students on the A/B block and traditional schedule with respect to reading and math FCAT scores in 2010. The independent variables were the A/B block and traditional schedules. The dependent variables were 2010 reading and math FCAT scores.

In Table 10, the results from the two-way ANOVA are illustrated. Analysis revealed no significant main effect of scheduling type or significant interaction at the .05 level. As a result, the hypothesis was not rejected.

Table 10

Two-Way ANOVA Results for 2010 Reading and Math FCAT Scores

Source of Variation	*SS*	*Df*	*MS*	*F*	*p* value	*F crit*
Rows	1056.25	1	1056.25	18.777	0.144	161.448
Columns	6.25	1	6.25	0.111	0.795	161.448
Error	56.25	1	56.25			
Total	1118.75	3				

Hypothesis 3_A

A comparison of students on the A/B block schedule to students on the seven-period traditional schedule will produce no significant difference in 2009 FCAT reading and math scores.

To analyze the third hypothesis of the study, means were calculated for 2009 FCAT reading and math scores. The means and standard deviations for students on the A/B block and traditional schedule are displayed in Tables 11. The data displays a higher mean reading score for students on the A/B block, and a higher mean math score for students on the traditional schedule during 2009.

A 2 X 2 repeated measures ANOVA was performed to examine the differences between students on the A/B block and traditional schedule with respect to reading and math FCAT scores in 2009. The independent variables were the A/B block and traditional schedules. The dependent variables were 2009 reading and math FCAT scores.

Table 11

Descriptors of 2009 FCAT Reading and Math Scores by Schedule

	Traditional Schedule		A/B Block Schedule	
Test	FCAT Reading	FCAT Math	FCAT Reading	FCAT Math
n	275	275	187	201
Mean	284	327	296	322
SD	48.67	44.68	47.52	51.25

In Table 12, the results from the two-way ANOVA are illustrated. Analysis revealed no significant main effect of scheduling type or significant interaction at the .05 level. As a result, the hypothesis was not rejected.

Table 12

Two-Way ANOVA Results for 2009 Reading and Math FCAT Scores

Source of Variation	*SS*	*df*	*MS*	*F*	*p*value	*Fcrit*
Rows	1190.25	1	1190.25	16.474	0.153	161.448
Columns	12.25	1	12.25	0.169	0.751	161.448
Error	72.25	1	72.25			
Total	1274.75	3				

Hypothesis 4_A

A comparison of students on the A/B block schedule to students on the seven-period traditional schedule will produce no significant difference in 2008 FCAT reading and math scores.

To analyze the fourth hypothesis of the study, means were calculated for 2008 FCAT reading and math scores. The means and standard deviations for students on the A/B block and traditional schedule are displayed in Tables 13. The data displays a higher mean reading score for students on the A/B block, and a higher mean math score for students on the traditional schedule during 2008.

Table 13

Descriptors of 2008 FCAT Reading and Math Scores by Schedule

	Traditional Schedule		A/B Block Schedule	
Test	FCAT Reading	FCAT Math	FCAT Reading	FCAT Math
n	292	290	159	216
Mean	283	327	294	319
SD	49.25	48.41	49.10	47.63

A 2 X 2 repeated measures ANOVA was performed to examine the differences between students on the A/B block and traditional schedule with respect to reading and math FCAT scores in 2008. The independent variables were the A/B block and

traditional schedules. The dependent variables were 2008 reading and math FCAT scores.

In Table 14, the results from the two-way ANOVA are illustrated. Analysis revealed no significant main effect of scheduling type or significant interaction at the .05 level. As a result, the hypothesis was not rejected.

Table 14

Two-Way ANOVA Results for 2008 Reading and Math FCAT Scores

Source of Variation	*SS*	*Df*	*MS*	*F*	*P-value*	*F crit*
Rows	1190.25	1	1190.25	13.188	0.171	161.448
Columns	2.25	1	2.25	0.0249	0.900	161.448
Error	90.25	1	90.25			
Total	1282.75	3				

Hypothesis 5_A

A comparison of students on the A/B block schedule to students on the seven-period traditional schedule will produce no significant difference in 2007 FCAT reading and math scores.

To analyze the fifth hypothesis of the study, means were calculated for 2007 FCAT reading and math scores. The means and standard deviations for students on the A/B block and traditional schedule are displayed in Tables 15. The data displays higher mean reading and math scores for A/B block-schedule students compared to traditional-schedule students in 2007.

A 2 X 2 repeated measures ANOVA was performed to examine the differences between students on the A/B block and traditional schedule with respect to reading and

math FCAT scores in 2007. The independent variables were the A/B block and traditional schedules. The dependent variables were 2007 reading and math FCAT scores.

Table 15

Descriptors of 2007 FCAT Reading and Math Scores by Schedule

	Traditional Schedule		A/B Block Schedule	
Test	FCAT Reading	FCAT Math	FCAT Reading	FCAT Math
n	239	239	217	158
Mean	295	323	303	331
SD	50.42	47.56	51.42	47.55

In Table 16, results from the two-way ANOVA are illustrated. Analysis revealed a significant main effect of scheduling type and a significant interaction at the .05 level. As a result, the hypothesis was rejected.

Table 16

Two-Way ANOVA Results for 2007 Reading and Math FCAT Scores

Source of Variation	*SS*	*df*	*MS*	*F*	*p* value	*Fcrit*
Rows	784	1	784	65535	.0000	161.448
Columns	64	1	64	65535	.0000	161.448
Error	0	1	0			
Total	848	3				

Hypothesis 6_A

A comparison of students on the A/B block schedule to students on the seven-period traditional schedule will produce no significant difference in 2006 FCAT reading and math scores.

To analyze the sixth hypothesis of the study, means were calculated for 2006 FCAT reading and math scores. The means and standard deviations for students on the A/B block and traditional schedule are displayed in Tables 17. The data displays a higher mean reading score for traditional-schedule students in comparison to A/B block students in 2006. Students under the traditional and A/B block schedule recorded the same mean math score in 2006.

Table 17

Descriptors of 2006 FCAT Reading and Math Scores by Schedule

	Traditional Schedule		A/B Block Schedule	
Test	FCAT Reading	FCAT Math	FCAT Reading	FCAT Math
n	220	219	201	186
Mean	294	324	291	324
SD	51.35	49.52	48.25	49.56

A 2 X 2 repeated measures ANOVA was performed to examine the differences between students on the A/B block and traditional schedule with respect to reading and math FCAT scores in 2006. The independent variables were the A/B block and traditional schedules. The dependent variables were 2006 reading and math FCAT scores.

In Table 18, results from the two-way ANOVA are illustrated. Analysis revealed no significant main effect of scheduling type at the .05 level. The results of the ANOVA revealed a significant interaction at the .05 level. As a result, the hypothesis was rejected.

Table 18

Two-Way ANOVA Results for 2006 Reading and Math FCAT Scores

Source of Variation	*SS*	*df*	*MS*	*F*	*p* value	*Fcrit*
Rows	992.25	1	992.25	441	0.030	161.448
Columns	2.25	1	2.25	1	0.5	161.448
Error	2.25	1	2.25			
Total	996.75	3				

Hypothesis 7_A

A comparison of students on the A/B block schedule to students on the seven-period traditional schedule will produce no significant difference in 2005 FCAT reading and math scores.

To analyze the seventh hypothesis of the study, means were calculated for 2005 FCAT reading and math scores. The means and standard deviations for students on the A/B block and traditional schedule are displayed in Tables 19. The data displays a higher mean reading score for students under the traditional schedule and a higher mean math score for students under the A/B block in 2005.

A 2 X 2 repeated measures ANOVA was performed to examine the differences between students on the A/B block and traditional schedule with respect to reading and math FCAT scores in 2005. The independent variables were the A/B block and traditional schedules. The dependent variables were 2005 reading and math FCAT scores.

Table 19

Descriptors of 2005 FCAT Reading and Math Scores by Schedule

	Traditional Schedule		A/B Block Schedule	
Test	FCAT Reading	FCAT Math	FCAT Reading	FCAT Math
n	208	207	176	149
Mean	301	322	286	323
SD	47.52	50.28	45.74	44.68

In Table 20, results from the two-way ANOVA are illustrated. Analysis revealed no significant main effect of scheduling type or significant interaction at the .05 level. As a result, the hypothesis was not rejected.

Table 20

Two-Way ANOVA Results for 2005 Reading and Math FCAT Scores

Source of Variation	*SS*	*Df*	*MS*	*F*	*P-value*	*F crit*
Rows	841	1	841	13.140	0.171	161.448
Columns	49	1	49	0.765	0.542	161.448
Error	64	1	64			
Total	954	3				

As part of investigating the first research question, the impact on yearly attendance rates and discipline referrals was examined.

Attendance Rates

Table 21 is a report comparing attendance rates for students under the A/B block schedule and students under the traditional schedule from 2005-2010. Between 2005 and 2006 school years, the A/B block school witnessed its largest change in student population, 769 to 745, 24 students. The traditional-schedule school witnessed its largest change in student population 2009 to 2010, 1061 to 996, 65 students.

Students under the A/B block schedule largest decrease in attendance rate was 2.65%, 2007 to 2008. In comparison, students under the traditional schedule largest decrease in attendance rate was less than 1%, 2006 to 2007. The largest increase in attendance rates occurred at the traditional-scheduled school, 1.83% during 2007 to 2008. The A/B block-scheduled school largest increase in attendance rates was 1.78% during 2006 to 2007.

Table 21

Attendance Rates by Year and Schedule

Year	2005	2006	2007	2008	2009	2010
			A/B Block Schedule			
n	769	745	756	769	757	750
%	84.53	84	85.78	83.13	82.41	82.04
			Traditional Schedule			
n	1004	1050	1064	1070	1061	996
%	80.76	82.02	81.56	83.39	83.48	83.79

During 2007, A/B block-scheduled students recorded the highest attendance rate, 85.78% for either schedule type for the 2005–2010 school years. The traditional-schedule students' highest attendance rate was 83.79%, during 2010.

Overall, a comparison of 2005 to 2010 attendance rates the traditional-schedule students climbed from 80.76% to 83.70%; an increase of 2.94%. In comparison, the A/B block-scheduled students fell from 84.53% to 82.04%; a decrease of 2.49%.

Discipline Referrals

Table 22 is a report on the comparison of discipline referrals for students under the A/B block schedule and students under the traditional schedule 2005–2010. In 2005, both schools recorded their highest amounts of total referrals: A/B block 1,882 and

traditional 2,221; in-school suspension (ISS) students: A/B block 1,143 and traditional 1,694; and out-of-school suspension (OSS) students: A/B block 309 and traditional 492.

Table 22

Discipline Referrals by Year and Schedule

Year	2005	2006	2007	2008	2009	2010
			A/B Block Schedule			
n	769	745	756	769	757	750
ISS	1143	1031	926	864	720	1024
OSS	309	195	141	173	291	279
Total	1882	1698	1666	1640	1589	1695
			Traditional Schedule			
n	1004	1050	1064	1070	1061	996
ISS	1694	1059	1517	1643	1260	1139
OSS	492	201	361	493	293	337
Total	2221	1313	1948	2180	2093	1979

In 2009, A/B block-scheduled students recorded their lowest number of total referrals (1,589) and in-school suspension students (720). In addition, the A/B block school recorded their lowest number of out-of-school suspension students (141) in 2007. Conversely, traditional-scheduled students recorded their fewest total referrals (1,313) and fewest in-school suspension students (1,059) and fewest out-of-school suspension students (201) in 2006.

The largest increase in discipline referrals for A/B scheduled-students occurred from 2009 to 2010, 1,589 to 1,695 (6.7%), and for traditional-scheduled students 2006 to 2007, 1,313 to 1,948 (48%). The largest decrease in discipline referrals for A/B scheduled-students occurred 2005 to 2006, 1,882 to 1,698 (9.7%), and for traditional-scheduled students 2006 to 2007, 1,313 to 1,948 (48%).

Overall, a comparison of 2005–2010 total discipline referrals reveals a decrease for A/B block-scheduled students from 1,882 to 1,695 (9.9%), and a decrease for traditional-scheduled students from 2,221 to 1,979 (10.9%).

Qualitative Data Presentation and Analysis

Analysis of Research Question 2

What are the administrator, teacher, and student perceptions of the impact A/B block scheduling has on student achievement, attendance, and discipline?

To analyze this research question, interview questions (See Appendix B) were developed with the intent to gather perceptions and opinions of a purposeful sample of participants. Two administrators, five teachers, and five students were posed the same five questions during face-to-face, phone, or email interviews. All participants were a part of the A/B block-scheduled school or traditional-schedule school 2005–2010. The participants remained anonymous, and identified only as Admin 1 or 2, Teacher 1 to 5, and Student 1 to 5. Documented in the ensuing section are the candid written and verbal responses of the participants.

1. What is your overall perception of student academic achievement within block scheduling?

Admin 1: *My own personal experience is that it produces extended learning time and more time for practice for kids, which can greatly enhance achievement. The caveat is making sure that the lesson plans and the 88-minute class is packed full of meaningful learning opportunities.*

Admin 2: *In general, it depends on the teacher and the planning and presentation they make in class. That will always be the biggest factor. For specific students with disabilities the block schedule is difficult because of retention. Well-prepared teachers who use the time wisely will be able to scaffold learning so that academic achievement will increase.*

Teacher 1: *From experience, I personally feel that each student excels in a block class. More students are reached in the small group that is able to exist in a block class. I had three groups, and they rotated from one assignment to the other and this helped to break up their time and their interest levels were not lost.*

Teacher 2: *My perception of academic achievement is that a blocked schedule allows the student the opportunity to complete assignments in the class time with instructional support.*

Teacher 3: *I am split with my perception of block scheduling. Block scheduling does eliminate that homework load of an individual. This is great especially for a student that is taking AP/Honors/Dual Enrollment classes. Often these students are bombarded with work on a traditional schedule and many of them have to choose between academics and other activities such as volunteering, sports, working, and clubs. We all know that the*

best individual is a well-rounded individual. Block scheduling also allows the teacher to incorporate other strategies or activities that usually would not fit into a traditional schedule. On the flip side, speaking from experience, I believe that most teachers somehow don't cover as much of the curriculum on block scheduling.

Teacher 4: *The block schedule appears to have had little effect on student grades only because teachers have adjusted their grading criteria. I think the effect on student learning is that student learning & achievement is decreased.*

Teacher 5: *I think academic achievement is improved simply because they have more time to spend on each subject each night. They are not working on seven homework assignments every day.*

Student 1: *I really enjoy it, allows more time to study and to do work. Mainly class work and homework, it just helps overall to have block scheduling.*

Student 2: *I believe students learn more and get more out of the subject.*

Student 3: *Grades are better.*

Student 4: *I don't believe that it makes any difference whether students have 90 minute classes or 45minutes. Those of us who are here to learn will learn. Why punish us with 90 minutes each day with the same teacher.*

Student 5: *Students have more time to ask questions and get their work done in class*.

2. What is your overall perception of the impact block scheduling has on student discipline?

Admin 1: *In my experience, there are fewer transitioning times. They go from seven or eight times a day to three or four, about a 50% reduction. This cuts down on discipline problems, probably about 25% to 30% decrease.*

Admin 2: *Again, it depends on the teacher, but there is less time for students to get into a discipline issue with less class changes, especially in regards to tardies. We saw a significant decrease in tardies when we went to block schedules.*

Teacher 1: *If a teacher plans the block class appropriately, the teacher should have no discipline problems, so long as the rules are set from day one and enforced ALL year long.*

Teacher 2: *Blocked classes leaves less time in the hallways where most discipline issues arise. Therefore, student discipline would decline.*

Teacher 3: *I think it minimizes student discipline.*

Teacher 4: *Since there are fewer class changes, the discipline in the hallways has appeared to improve; however, discipline in the classroom has become more difficult with a class period that is longer.*

Teacher 5: *Because children are in the halls less often, discipline problems have been reduced.*

Student 1: *I would think it would reduce that because teachers and students see each other every other day. A student that may not like a teacher will not have to go to that class every day.*

Student 2: *I don't think it has any effect. It really depends on the teacher and his/her discipline procedures.*

Student 3: *Sometimes if the teacher isn't prepared with a lengthy lesson or activity, some kids get a little antsy.*

Student 4: *In terms of discipline, there is more of a negative impact on block scheduling than a positive one. It is not a comfortable setting for students who have problems following directions and sitting for more than thirty to forty minutes per class.*

Student 5: *I am not sure that it effects or impacts their discipline.*

3. To what extent, if any, does the block schedule affect student attendance?

Admin 1: *With the alternate block, the study hall becomes a breeding ground for skipping. Then students might start to skip 1st period if it is a study hall and then those days begin to add up. Students might also leave for lunch and not come back, so attendance seems to get worse for many students.*

Admin 2: *That is an area where I saw a negative effect by the block schedule. When students are out for more than one day, they miss a lot of direct instruction by the teacher. The problem of make-up work compounded with the newly assigned work the student receives after returning to school is overwhelming to some students. This can result in lower academic success.*

Teacher 1: *I do not believe the block scheduling affects students' attendance.*

Teacher 2: *Attendance has no bearing on a blocked schedule and a block schedule does not impact a student's attendance.*

Teacher 3: *It has no affect at all.*

Teacher 4: *I don't think whether or not a student is absent has been affected; however, what has been affected is the lack of student learning resulting from an absence. Since in block schedule, one class period is equivalent to two days on a regular schedule, when a student misses a class, the amount of material covered is much greater and it is more difficult to for the students to "catch up."*

Teacher 5: *I'm not sure it really affects attendance from the student's viewpoint, but it does affect grades when students are absent. They miss a lot more material and are farther behind. For some, catching up is very difficult.*

Student 1: *I do not think it will really affect that. If a student is going to skip, they are going to do it anyway.*

Student 2: *Students with attendance problems will have attendance problem no matter what the schedule is.*

Student 3*: I don't think it affects it at all.*

Student 4: *It has nothing to do with attendance. Students who will be absent on a traditional schedule will be absent on a block.*

Student 5: *It doesn't at all.*

4. How does the block schedule influence the instructional strategies at your school?

Admin 1: *Teachers have to be very selective with your instructional strategies. It really depends on your target audience on how diverse your instructional tool bag has to be.*

Admin 2: *It forces teachers to grow and by this, I mean they have to add to their toolbox of strategies in their presentations. This is a good thing. Teachers can go more in depth with a subject or be able to relate it to the real world.*

Teacher 1: *From my personal experience, I feel that I have had MORE time to implement instructional strategies and feel the students grasp them better as well.*

Teacher 2: *The instructional strategies supported within a block schedule allows for review, an introduction, teaching, student participation, and student independent work.*

Teacher 3: *Those courses like science or PE that utilizes the block are able to implement more instructional strategies. Teachers are able do more labs with students. On the other hand, I have talked with teachers in courses like world history and they strongly dislike.*

Teacher 4: *A block schedule, in math, requires the teacher to cover two lessons instead of one, since each class period on a block schedule counts as two class periods on a traditional schedule. But a block class period is only 150% of the class period on a traditional schedule instead of 200%, therefore the material covered is not covered at as great a depth as in the traditional schedule. Also, due to the longer block class period, the teacher must have several different activities in one class period. This results in a more disjointed and hectic classroom management for the teacher. For the lower ability student, this means they haven't really absorbed or finished one activity before they are on to the next.*

Teacher 5*: I think it helps teachers find new ways to instruct. You can't lecture for 90 minutes straight and expect the students to stay awake. You have to vary your instruction to include different formats to keep the students interested.*

Student 1: *I think it's helping as they are getting more things done. You are getting as much science and history as math and English. Also being better prepared for end of the year tests. There is a lot more group work as well. There is a lot more time.*

Student 2: *I believe that teachers will be more apt to try new things with more time. It gives the teacher the ability to be flexible.*

Student 3: *Teachers implement more strategies during block.*

Student 4: *In some classes, it seems that teachers struggle to teach for ninety minutes.*

Student 5: *It gives the teacher more time to explain the lesson.*

5. What is your impression of transitioning from the block schedule to a traditional schedule?

Admin 1: *Usually teacher morale is the first issue affected. Their planning period is altered or even eliminated, and they may have to cover a study hall. Teacher-student relationship may also suffer because of the fact that teachers may have less time for planning and to see students outside the classroom.*

Admin 2: *Transitioning either way means teachers have to learn how to plan and present differently. It will cause the typical "change stress" we all experience when change occurs but it also gives us an opportunity to look at what we have been doing and decide if it is quality important work.*

Teacher 1: *At first, many will have a bit of difficulty adapting, but after doing it for two years, I think it is great.*

Teacher 2: *Transitioning in general would require some planning, but teachers are willing to try changes that benefit student achievement.*

Teacher 3: *Making such a transition for teachers will take just enough time for them to realize that I have all year to cover this information. I don't think it's a big deal, just takes a little planning.*

Teacher 4: *I think the teachers and students will feel much less pressured to get "through" material. The teachers, such as math, that have a more rigorous and mandated course curriculum will be able to present material in more depth, and have more class time to ensure student comprehension.*

Teacher 5: *It's easier to transition from block to traditional than vice versa. For those who never taught on block, filling up the 90 minutes can be stressful to start with. Going the other way, you just run out of time. It is hard to get lab courses completed in 45 minutes and not lose continuity if you have to spread it out over two days' time.*

Student 1: *It would be easier for middle school students coming in to the high school rather than the students who are already high school. It would be better for all schools to have the same schedule and transition together, especially for transfer students.*

Student 2: *The only problem that I see would be a student thinking that the class should have been over midway through the year. Other than that, it should be a smooth transition.*

Student 3: *I think students that go from a block to traditional will survive because they are already used to working or involved in instruction for a long time and 45 minutes would seem short.*

Student 4: *The change maybe a bit trying at first, but I'll adjust.*

Student 5: *It is not that difficult but students do have to get used to it.*

Summary

The objective of this research study was to determine the impact block scheduling had on student achievement, attendance, and discipline at the high school level for the

years 2005–2010. Chapter 4 presented an analysis of the data collected pertaining to FCAT reading and math scores, attendance rates, discipline referrals from 2005–2010, as well as administrator, teacher, and student perceptions. The two research questions guiding this study and the hypotheses tested were reviewed. The first research question was explored by examining seven hypotheses that dealt with scheduling types and the impact on student achievement, attendance rates, and discipline referrals. The second research question was examined by documenting the perceptions of administrators, teachers, and students during interviews.

Data were analyzed using descriptive and inferential statistics. Two-way ANOVA analysis revealed several significant and insignificant results. A total of seven repeated ANOVAs were conducted to analyze the difference between the two schedule designs with respect to two achievement indicators; reading and math FCAT scores. Overall, students experienced higher FCAT reading scores on the A/B block schedule than the traditional schedule. Conversely, students experienced higher FCAT math scores under the traditional schedule than the A/B block schedule.

In reference to the impact scheduling types had on 2005–2010 attendance rates, students under the A/B block showed a moderate decrease of 2.49%, while students under the traditional schedule showed a moderate increase of 2.94%. In reference to the impact scheduling types had on discipline referrals 2005–2010, students under the A/B block recorded a decrease of 9.9%, while students under the traditional schedule recorded a decrease of 10.9%.

The overall administrator, teacher, and student perception is that block scheduling fosters extended learning sessions, which can increase student achievement if properly

planned. In addition, advanced classes seem to flourish with block scheduling, by granting the opportunity to finish assignments during class time. Furthermore, they felt that with fewer transitions, the overall discipline issues decreased, and only teachers who did not plan effectively struggled with in class disruptions. Additionally, it was believed that attendance was not affected by the block schedule, but it did allow for the implementation of various instructional strategies. Finally, transitioning from a traditional to a block schedule was thought to be difficult at first but attainable with additional planning and would relieve some of the pressure that some feel from a shorter, rushed traditional schedule.

Chapter 5 includes a summary of the findings with respect to each research question, draws and discusses conclusions, and offers recommendations for the future.

CHAPTER FIVE: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Overview

In the new millennium, many school districts have chosen to implement block scheduling in an effort to increase student achievement, address student attendance, and discipline problems that exist in public schools. Scientific research on scheduling must be readily available in order for administrators, teachers, and other key stakeholders to make educated decisions. This research study was designed to add to the empirical data on scheduling. Chapter 5 is broken down into five sections, which include a summary of the major findings, conclusions, implications for practice, implications for research, and recommendations.

Summary of the Study

The purpose of this mixed method, quasi-experimental study was to examine the impact A/B block scheduling had on (a) student achievement, attendance, and discipline, and (b) teacher, administrator, and student perceptions during 2005–2010. The reading and math 2005–2010 FCAT scores measured student achievement. Attendance was measured by 2005–2010 attendance rates, and discipline was measured by discipline referrals and suspensions. A southern Florida school district provided all data.

The quantitative portion of this study asked is there a significant difference in FCAT reading and math scores, student attendance rates, and discipline referrals between students on an alternate day block schedule and students on a seven-period traditional

schedule. The following seven subquestions were researched to help answer this question:

1. For the 2005–2010 school years, is there a significant difference in FCAT reading and math scores, student attendance rates, and discipline referrals between students on an alternate day block schedule and students on a seven-period traditional schedule?
2. For the 2010 school year, is there a significant difference in FCAT reading and math scores between students on an alternate day block schedule and students on a seven-period traditional schedule?
3. For the 2009 school year, is there a significant difference in FCAT reading and math scores between students on an alternate day block schedule and students on a seven-period traditional schedule?
4. For the 2008 school year, is there a significant difference in FCAT reading and math scores between students on an alternate day block schedule and students on a seven-period traditional schedule?
5. For the 2007 school year, is there a significant difference in FCAT reading and math scores between students on an alternate day block schedule and students on a seven-period traditional schedule?
6. For the 2006 school year, is there a significant difference in FCAT reading and math scores between students on an alternate day block schedule and students on a seven-period traditional schedule?

7. For the 2005 school year, is there a significant difference in FCAT reading and math scores between students on an alternate day block schedule and students on a seven-period traditional schedule?

The qualitative portion of this study sought to answer what are the administrator, teacher, and student perceptions of the impact block scheduling has on student achievement, attendance, and discipline. Face-to-face, phone, and email interviews were utilized to gather the twelve participants' personal views and opinions in their own words. The interview process began in June 2011 and concluded in August 2011. Appendix B presents the interview questions each participant answered candidly.

The first research question was written as seven hypotheses for testing. The subsequent section discusses the quantitative findings from this study in reference to the seven hypotheses.

Summary of the Findings

Quantitative Findings

Hypothesis 1_A purported that a comparison of students on the A/B block schedule to students on the seven-period traditional schedule will produce no significant difference in 2005–2010 FCAT reading and math scores, student attendance rates, and discipline referrals. Through statistical analysis, the overall trend revealed slightly higher reading FCAT scores and attendance rates for students under the A/B block schedule, but slightly higher math FCAT scores and significantly higher discipline referrals for students under the traditional schedule.

According to the two-way ANOVA results, the mean FCAT scores and attendance rates for the two groups did not differ significantly at the .05 level. The findings substantiate earlier assertions that schedule design has no affect on standardized tests scores (Arnold, 2002; Martin-Carreras, 2006; Veal & Schreiber, 1999) or attendance rates (Balsimo, 2005) but refutes findings that purport block scheduling can raise standardized test scores (Andrews, 2003; Forman, 2009; Lewis et al., 2005) and bolster attendance rates (Buckman et al., 2002). One possible explanation for this is that many studies compare one year of data as opposed to a longer period. This study investigated six years of data, and perhaps student achievement levels and attendance rates level out regardless of schedule design when viewed longitudinally.

In reference to discipline referrals, the significant difference found can be attributed to the school population in 2005–2010; 6,245 students under the traditional schedule in comparison to 4,546 students under the A/B block schedule. This contradicts an earlier study by Balsimo (2005), where no significant difference was found between students under a block and traditional schedule during a nine-year study. However, it is important to note that Balsimo (2005) compared data from two years of traditional scheduling to seven years of block scheduling.

Hypothesis 2_A stated that a comparison of students on the A/B block schedule to students on the seven-period traditional schedule will produce no significant difference in 2010 FCAT reading and math scores. Through statistical analysis, the data revealed slightly higher reading FCAT scores for students under the A/B block schedule, but slightly higher math FCAT scores for students under the traditional schedule.

According to the two-way ANOVA results, the mean FCAT scores for the two groups did not differ significantly at the .05 level. In conclusion, the schedule design did not affect the 2010 reading or math FCAT results. Similar to the student achievement results from hypothesis $1_{A,}$ this finding substantiates as well as refutes past research.

Hypothesis 3_A stated that a comparison of students on the A/B block schedule to students on the seven-period traditional schedule will produce no significant difference in 2009 FCAT reading and math scores. Through statistical analysis, the data revealed slightly higher reading FCAT scores for students under the A/B block schedule, but slightly higher math FCAT scores for students under the traditional schedule.

According to the two-way ANOVA results, the mean FCAT scores for the two groups did not differ significantly at the .05 level. In conclusion, the schedule design did not affect the 2009 reading or math FCAT results. Similar to the student achievement results from hypothesis $1_{A,}$ this finding substantiates as well as refutes past research.

Hypothesis 4_A stated that a comparison of students on the A/B block schedule to students on the seven-period traditional schedule will produce no significant difference in 2008 FCAT reading and math scores. Through statistical analysis, the data revealed slightly higher reading FCAT scores for students under the A/B block schedule, but slightly higher math FCAT scores for students under the traditional schedule.

According to the two-way ANOVA results, the mean FCAT scores for the two groups did not differ significantly at the .05 level. In conclusion, the schedule design did not affect the 2008 reading or math FCAT results. Similar to the student achievement results from hypothesis $1_{A,}$ this finding substantiates as well as refutes past research.

Hypothesis 5_A stated that a comparison of students on the A/B block schedule to students on the seven-period traditional schedule will produce no significant difference in 2007 FCAT reading and math scores. Through statistical analysis, the data revealed slightly higher reading and math FCAT scores for students under the A/B block schedule.

According to the two-way ANOVA results, the mean FCAT scores for the two groups differed significantly at the .05 level. In conclusion, the schedule design had an impact on the 2007 reading or math FCAT results, and hypothesis 5_A was rejected. Similar to the student achievement results from hypothesis $1_{A,}$ this finding substantiates as well as refutes past research.

Hypothesis 6_A stated that a comparison of students on the A/B block schedule to students on the seven-period traditional schedule will produce no significant difference in 2006 FCAT reading and math scores. Through statistical analysis, the data revealed slightly higher reading FCAT scores for students under the traditional schedule, and the same mean math FCAT score for students under the A/B block and traditional schedules.

According to the two-way ANOVA results, the mean FCAT scores for the two groups did not differ significantly at the .05 level. In conclusion, the schedule design did not affect the 2006 reading or math FCAT results. Similar to the student achievement results from hypothesis $1_{A,}$ this finding substantiates as well as refutes past research.

Hypothesis 7_A stated that a comparison of students on the A/B block schedule to students on the seven-period traditional schedule will produce no significant difference in 2005 FCAT reading and math scores. Through statistical analysis, the data revealed slightly higher reading FCAT scores for students under the traditional schedule, and slightly higher math FCAT scores for students under the A/B schedule.

According to the two-way ANOVA results, the mean FCAT scores for the two groups did not differ significantly at the .05 level. In conclusion, the schedule design did not affect the 2005 reading or math FCAT results. Similar to the student achievement results from hypothesis $1_{A,}$ this finding substantiates as well as refutes past research.

Qualitative Findings

Administrator perception. Ten Florida high school principals and assistant principals were contacted regarding this study, and two were chosen to record their responses. The administrator perception captured through a phone and email interview was that the A/B block schedule produces extended learning time with the caveat that teachers and students have to utilize it properly. Consistent with this study, Hamdy and Urich (1998) found student achievement can benefit from the A/B block schedule if teachers plan and prepare was also the feeling of both administrators. They also believed that with fewer transition times, discipline problems decrease, including tardies and hallway disruptions, which substantiate earlier studies by Griffin and Nicholson (2002) and Deuel (1999).

With respect to attendance, the administrator perception of A/B block schedule included some negative feelings. The administrators felt that students missed class due to an excused absence or skipping and that the assignments for those days would begin to pile up. It becomes increasingly difficult to make up work and as a result, student achievement usually suffers. Teacher instructional strategies were thought by administrators to cultivate and diversify based on their target audience, as they were allotted the time to go more in depth when covering their subject matter. The results

mirror the results found by Deuel (1999), in a study of the perceptions of administrators in Broward County high schools.

Finally, when transitioning from the A/B block schedule to traditional schedule, administrators feel that teachers need to be cognizant of the fact that additional planning will be required. In addition, the administrators believed that teacher stress levels might increase and morale and teacher-student relationship decrease when the planning time diminishes from the scheduling change, which contradicts an earlier study by Khazzaka (1998).

Teacher perception. Twenty Florida high school teachers were contacted regarding this study; five were chosen to have their responses recorded. The teacher perception captured through face-to-face, phone and email interviews regarding A/B block schedule produced mixed results. Several believed that the extended time allotted students the time to get assignments completed while focusing on fewer classes and teachers felt student achievement increased because of those reasons. Contradictorily, other teachers deemed the A/B block schedule had little effect on student achievement and that student learning actually decreased, which endorses previous studies by Allen (2009) and Mondi (2009), who found that many teachers preferred a traditional schedule over a block schedule.

With respect to discipline problems, all the teachers agreed that the A/B block schedule aides in minimizing student discipline because of fewer transition times. The teacher perception included safer and more manageable hallways; however, classroom management may be an issue when poor planning exists. Attendance and the A/B block schedule were not connected according to the teacher perception; however, student

grades were adversely affected when they miss a class because of the plethora of material covered, mimicking the findings of Pisapia and Westfall (1997). Contradictorily, this refutes earlier data found in a study by Gainey and Brucato (1999), where teacher and student attendance improved on the block schedule.

Similar to the administrator perception, teachers also feel the work begins to pile up and it becomes increasingly difficult to make up work. Teacher instructional strategies were believed by teachers to depend on the subject that was taught. For science and physical education teachers, the A/B block allotted more time to start and finish projects and events. They could incorporate more into their lessons, as opposed to a math teacher encumbered with the arduous task of completing two lessons per day. Consistent with this study, Allen (2009) found that math teachers preferred to teach on the traditional schedule.

Language arts teachers believed they have additional time to utilize instructional strategies that the students will better understand, echoing the perceptions of teachers in the Benton-Kupper (1999) study. It is also important to note that although the class time is more per day in a block schedule, the traditional schedule actually allots more total class time for learning. The teacher perception regarding transitioning from the A/B block schedule to traditional schedule is that planning and preparation are paramount, which fortifies earlier claims by Mondi (2009), where pre-service activities are paramount for teacher success.

Lastly, teachers were split on how to adapt to this situation, but most were positive about such a switch. Several believed that they would actually get to cover more material than they would have the entire year, and this could result in teachers and

students feeling less stressed, which substantiates the findings of Cosimano (2004), Griffin and Nicholson (2002), and Evans et al. (2002).

Student perception. Twenty Florida high school students were contacted for the purpose of this study; five were chosen to have their responses recorded. Through phone and email interviews, the overall student perception gathered included students' grades improving, students learning more, and students allotted more time to study. The research outcomes of Allen (2009) and Corley (2003) concur with these results.

With respect to discipline, students were divided on whether the A/B block had a positive or negative impact. What was clear is students feel that the teacher plays a major role in maintaining a positive learning environment, and if a teacher has not planned accordingly, students will get restless, similar to the findings of Marshak (2001). In addition, one student believed that it was uncomfortable to sit in class for a lengthy period, especially with other students who have trouble following directions, mirroring the results from Griffin and Nicholson (2002).

The overall student perception regarding the A/B block schedule impact on student attendance was that there was no connection between the two. It was stated several times that students will miss class no matter what schedule, and those who skip class will do so regardless of the schedule. Students also believed that teachers were more apt to try new teaching methods with the extra class time allotted by the A/B block. It is also important to note that while one student believed there were some teachers utilizing a lot more group work, another student believed that some teachers struggled trying to teach for the entire block.

As a final point, some students feel that transitioning from the A/B block schedule to traditional schedule should not be too difficult because they are already used to working for 90 minutes of class. In addition, a student believed that the schedule change should start with students coming from middle school and not those already in high school. Furthermore, a student believed that a problem might arise with students thinking they were done with a class after half the year, but they also thought that the transition would be a smooth one.

Conclusions

In an attempt to elucidate some of the ambiguities that exist concerning the impact A/B block scheduling may have on student achievement, attendance, and discipline, this study utilized more of a longitudinal approach than most past research. The data related to the reading and math FCAT scores indicated that student academic achievement was similar on the block as well as on the traditional schedule. Although the mean reading FCAT scores were slightly higher for the students under the A/B block schedule, and the mean math FCAT scores were slightly higher for the students under the traditional schedule, neither differed significantly. Thus, the study provided no evidence of scheduling type impacting student achievement.

Coincidentally, this contradicts the perceptions of the administrators, teachers, and students, who all believed that the A/B block is much better when utilized properly for student achievement. It is plausible that teachers provided the same quality of instruction to students in regards to the FCAT regardless of schedule, thus preparing them for the FCAT. Another conceivable notion is that students lacked the drive and

motivation, regardless of schedule type, to obtain above-average scores, as the scores were consistently average, around 300. It is also important to note that from 2005–2010, students on both schedules scored higher on the math FCAT than on the reading FCAT. This could be a testament to the math teachers incorporating a wide variety of instructional strategies than language arts or reading teachers, conducive for raising student achievement, or simply students being better prepared for math than reading during their middle school days. In conjunction with that, the math FCAT may be more straightforward than the reading FCAT for 10th-grade students, thereby producing noticeably higher scores by students.

The lack of substantial information concerning scheduling type and the impact on student attendance and discipline spurred part of this study. After retrieving data from 2005–2010, it was concluded that attendance rates did not differ significantly. As previously mentioned, this could be the result of the longitudinal approach of this study, as opposed to the snapshot many past studies attain by retrieving one or two years of data. In addition, the feelings of administrators, teachers, and students were consistent regarding student attendance on the A/B block schedule. For the most part it seems that some students skip class and are frequently absent no matter what schedule, but since the block affords teachers the opportunity to assign double the work that a teacher under a traditional schedule would, students can really struggle.

Furthermore, when students miss class it tends to create more of a discipline problem, rather than an attendance issue. In some instances students may believe that the security effort at school is feeble, and they can get away with skipping out or not attending at all. Therefore, the significant difference found between 2005–2010 discipline

referrals for students on the A/B block and the traditional schedule was not surprising. With a larger volume of students at the school on the traditional schedule than the school on the A/B block schedule, it make sense that there would be a higher volume of discipline infractions.

The notion that discipline improves on the A/B block schedule was conveyed in the majority of responses by the administrators, teachers, and students. Ostensibly with fewer transition times between classes, which equates to less time out of class during the day for students, discipline incidents would be less under the A/B block than under the traditional schedule. The only caveat with that is administrators and teachers may be just reporting and recording fewer discipline incidents, disregarding some, in an effort to make their school look more appealing to new students and parents.

The remaining perceptions of administrators, teachers, and students from this study centered on instructional strategies and transitioning from the A/B block schedule to the traditional schedule. The majority believed that with additional time, teachers were allowing students to work in groups more often and getting more in depth with the curriculum. One explanation for their views is the assumption that teachers cannot lecture for the whole block and have to incorporate more student-centered activities. Another line of thinking is that teachers and students struggle to utilize the large block of time judiciously and end up squandering it.

The perceptions concerning transitioning from the A/B block to traditional schedule produced varied results. The administrators believe it would require more teacher planning, thereby increasing stress levels, and adversely affect teacher-student relationships. The teachers feel they could cover more material, while being less pressed

for time. The students are accustomed to 90 minutes and perceive a smooth transition because of the shorter class time. They also felt that such a change should be initiated with the upcoming middle school students. It is plausible that they are all correct in their assumptions, as they are linked to past research; however, it would be interesting to examine how the perceptions vary depending on the stakeholder's status.

Implications for Practice

The study focused on the impact block scheduling had on student achievement, attendance, and discipline. Several implications for practice emerged from the findings and conclusions of this study. First, with respect to student achievement, the A/B block-scheduled school should investigate teaching all math classes utilizing a traditional time frame (50 minutes), and the traditional-scheduled school should investigate teaching all reading classes utilizing the block time frame (90 minutes). This is predicated on the 2005–2010 reading and math FCAT results and several teacher and student perceptions, as well as the results from the Allen (2009) study.

Second, in reference to attendance rates, every effort was made to examine any difference based on schedule type. The results suggest that no matter the type of schedule, students will miss school days, and some will skip classes. School officials need to form committees dedicated to ascertaining the root causes for these students missing valuable class time, research model schools that have steady or increasing attendance rates, and implement their proven strategies and plans to boost attendance rates. It may be that certain teachers need to incorporate more student-centered

instructional strategies, as well as school leaders developing incentive plans for students who consistently make it to class.

Third, district administrators such as superintendents and assistant superintendents should investigate implementing reduction strategies for discipline issues. Since switching to the A/B block schedule or to a traditional schedule will present diverse discipline issues, school districts must invest time and money to research methods that are proven to reduce referrals as well as in-school and out-of-school suspensions. As suggested by Brown (2006), direct observation of teacher classrooms may play a major role in identifying and analyzing the common behaviors of teachers and students that lead to discipline infractions. Furthermore, the topics of discussion when observing classrooms should be classroom management and instructional strategies that are producing the most favorable results.

Finally, adequate professional development is instrumental when implementing any schedule switch, or even remaining on the same schedule. Administrator and teacher perception echoed this sentiment within this study, and district- and school-level leaders need to be cognizant of this fact. Moreover, the administrator and teacher training should start well in advance before a schedule change is incorporated and needs to be thorough in sharing sound strategies for various instructional methods, increasing attendance rates and reducing discipline referrals. As Adrian (2009) and Mondi (2009) both purport, many teachers lack the proper professional training to stay current in a changing educational system and professional development is paramount in combating this issue.

Implications for Research

Predicated on the findings and conclusions of this study, more in-depth research is necessary regarding the effects of scheduling type on student achievement, attendance, and discipline. The following implications for research are offered for future studies:

1. This study should be replicated in future years within Florida and other states. In order to expand the size and diversity of the study population, a multistate study needs to be commissioned. The results from such a study would give educators and practitioners a national view of any impact scheduling has on student achievement, attendance, and discipline.
2. A key concept for future research would be to expand the indicators for student achievement. This study examined reading and math FCAT scores only, but as Florida and other states transition to End of Course (EOC) Assessments, they should be the focal point for measuring student achievement. The benefit for this is a researcher could investigate if scheduling type has any effect on the core area subjects such as math, English, science, and social studies.
3. The amount of research regarding the impact block scheduling may have on student attendance and discipline is inadequate, and this study only examined the attendance rates and discipline referrals. Future researchers need to expand the indicators for comparison to include graduation rates, drop-out rates, suspensions, and expulsions, to determine which type of schedule should be utilized to have a positive impact.

4. This study addressed the perceptions high school administrators, teachers, and students on the topic of block scheduling. Future researchers should include a diverse group of stakeholders at the district level such as superintendents, assistant superintendents, directors, innovative specialists, curriculum specialists, program specialists, testing coordinators, and instructional coaches. At the school level, researchers should include deans, guidance counselors, school psychologists, and school resource officers.
5. For the purpose of this study, only students on the A/B block schedule were compared to students on the traditional schedule. Future research should expand the groups of students examined to include a comparison of students on the modified block schedule, intensive block schedule, and the trimester schedule, to determine if they impact student achievement, attendance, and discipline. In addition, school districts should commission action research projects to determine which schedule is the best fit for them.

Recommendations

Several recommendations have become evident through the research conducted within this study. First and foremost, a schedule in and of itself cannot facilitate an increase in student achievement or attendance rates, or a decrease in discipline referrals. It takes key stakeholders, and mainly well-trained and informed teachers in the classroom and well-informed administrators circulating throughout the school, to make a difference. With that, this researcher recommends that not only teachers be trained on enhancing their classrooms predicated on the scheduling they are teaching on, but also

administration needs to take part in the training sessions that will help them to become better evaluators and mentors, and facilitate when needed. Guidance counselors also need training on how to effectively schedule classes within a designated schedule, and they also need to be cognizant of any conflicts that can and will arise.

Second, it is pertinent to note is that this researcher encountered several studies during this research project that boasted inconsistent findings and incomplete data. This was similar to the Zepeda and Mayers (2006) study that revealed a plethora of studies with missing information regarding demographics, methodologies, and settings. This researcher recommends, as a general warning, that it is paramount school districts truly examine the research, or perhaps hire someone to do so. Districts can ill-afford to predicate decisions that will affect so many key stakeholders on flawed information. When valuable statistics are missing from a research report, how can an informed decision be reached? Yet some districts continue to rely on reports of a report, instead of doing their research firsthand.

Third, it seems that district administrators, at times, out of the sake of convenience, seem to foster a notion of one-size-fits-all, which really needs to be dismissed and abandoned. This researcher highly recommends that school districts conduct their own research within their district before making a decision to place all of their secondary schools on the same schedule. Speaking from experience, high schools within the same district can exist on different schedules. The caveat with that is what to do when students transfer. Guidance counselors would have the added responsibility of making sure transient students were cognizant of and received the correct number of credits for graduating on a new schedule.

Finally, there seems to be a plethora of research conducted at the high school level and very little at the middle school level. This researcher firmly believes that the same issues we see at the high school level are trickling down into the middle school and need to be addressed. Some of these issues include faltering attendance rates, in-school and out-of-school suspensions, and expulsions. Researchers need to start delineating data from middle schools, pilot some of these modified schedules, and use the findings as a valuable resource for high school scheduling. Similar to little league sports, with uniformed training sessions that teach fundamentals, students should be properly equipped at an early age to be successful on the type of schedule their high school will foster.

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APPENDICES

APPENDIX A

Florida High School Report Card

A/B HIGH SCHOOL (000) COUNTY (00) SCHOOL ADDRESS School Phone: 000-000-0000, School Principal: A.B. Block		
Subject	**State of Florida A+ Plan**	**Federal No Child Left Behind Act**
School Grade	**Pending*** This grade is calculated by adding points earned from each of the performance areas below.	**74 % of criteria satisfied** **NO** This percent is based on a total of 39 criteria that every school must meet, if applicable.
Reading	- 42% of students reading at or above grade level - 45% of students making a year's worth of progress in reading - 34% of struggling students making a year's worth of progress in reading	WHITE, BLACK, HISPANIC, ECONOMICALLY DISADVANTAGED, STUDENTS WITH DISABILITIES students in this school need improvement in Reading
Math	- 76% of students at or above grade level in math - 75% of students making a year's worth of progress in math - 69% of struggling students making a year's worth of progress in math	HISPANIC, ECONOMICALLY DISADVANTAGED students in this school need improvement in Math.
Writing	- 67% of students are meeting state standards in writing.	This school has not met this criteria.
Science	- 45% of students at or above grade level in Science.	
Retakes	- 51% of 11th and 12th grade students passed the FCAT Reading Retake. - 43% of 11th and 12th grade students passed the FCAT Math Retake.	
Possible Choice Options	Your child is not eligible for an opportunity scholarship for public school choice under the A+ Plan. **A/B HIGH SCHOOL** has not met federal adequate yearly progress under No Child Left Behind because it needs improvement in one or more areas. Because this is a Title I school, your student may be eligible for school choice options under No Child Left Behind. Contact your district office at 000-000-0000 for other choice options available to you.	
**Title I refers to the federal law that provides funding for low-income students. A school is eligible for Title I status when at least 35% (targeted assistance) or 40% (school		

wide) of its students qualify for free or reduced-price lunch based on their families' income levels.

APPENDIX B

Interview Questions

1. What is your overall perception of student academic achievement within block scheduling?
2. What is your overall perception of the impact block scheduling has on student discipline?
3. To what extent, if any, does the block schedule affect student attendance?
4. How does the block schedule influence the instructional strategies at your school?
5. What is your impression of transitioning from the traditional schedule to a block schedule?

APPENDIX C

Participant Consent Form

You are being asked to participate in a research-based project investigating the administrator, teacher, and student perceptions of block scheduling and its effect on student achievement and school climate. Your required participation time includes a 30-minute interview; answering questions regarding the effect, that scheduling has on student achievement and school climate. The sessions will be taped using audio equipment to assist the researcher with documentation of the discussion topics. I will erase all info after the study is complete.

There are no known risks associated with your participation in the interview. There are also no direct benefits to you, although the knowledge gained from the study may benefit your school in investigating teachers' perceptions regarding the relationship between block scheduling, student achievement and school discipline. Your school can utilize this knowledge to further create schedules, which maximizes student achievement while improving school climate.

I will be asking you questions on issues regarding block scheduling. You are free to stop the interview at any time if you feel uncomfortable. All information you provide will be confidential and will not be identifiable. Your participation is voluntary. There will be no harm towards you if you choose not to participate and it will not affect any relationship you have with the School District.

If you have questions about the study, you may contact Charles Williams Jr. at 352-348-5696 or at cwilliamsjr1@cfl.rr.com. You may also contact my faculty advisor, Dr. James Mitchell at 510-6933506 or at jmitchell@argosy.edu.

By signing this document, you give your consent to be a research participant. Thank you in advance for your participation.

Sincerely yours,

Charles Williams Jr.

_____ _____

Signature of Dissertation Chairperson Signature of Focus Group Participant

APPENDIX D

Parental Permission Form

Your student is being asked to participate in the following research-based project: The Impact Block Scheduling has on Student Achievement, Discipline, and Attendance at the High School Level. We will investigate administrator, teacher, and student perceptions of block scheduling and its effect on student achievement and school climate.

Participation is voluntary, and will include an interview, approximately 30 minutes. A copy of the interview questions, exploring the effect that scheduling has on student achievement and school climate, will be made readily available to you. The sessions will be taped using audio equipment to assist the researcher with documentation of the discussion topics. I will erase all information after the study is complete.

There are no known risks associated with participating in the interview There are also no direct benefits to you, although the knowledge gained from the study may benefit your school in investigating teachers' perceptions regarding the relationship between block scheduling, student achievement and school discipline. Your school can utilize this knowledge to further create schedules, which maximizes student achievement while improving school climate.

If you have questions about the study, you may contact Charles Williams Jr. at 352-348-5696 or at cwilliamsjr1@cfl.rr.com. You may also contact my faculty advisor, Dr. James Mitchell at 510-6933506 or at jmitchell@argosy.edu.

I have read the above information regarding the study, which describes what my child will be asked to do if they choose to participate in the study. I also understand that participation is voluntary, and they can quit at any time:

□ Yes – I give permission for my child to participate in the study.

-OR-

□ No – I do not give permission for my child to participate in the study.

_____ _____

Parent/Guardian Signature Date