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A Test Score Comparison between Block and Traditional Scheduling

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A TEST SCORE COMPARISON BETWEEN BLOCK AND TRADITIONAL SCHEDULING

by

YANCY JASON FORD

(Under the Direction of Jason LaFrance)

ABSTRACT

The purpose of this study was to examine how schools utilizing block scheduling and traditional scheduling models differ in achievement levels on the five Georgia End-of-Course Exams (EOCT) and the Georgia High School Graduation Writing test (GHSWT) at two high schools in rural South Georgia. The researcher investigated if there is a differential benefit in terms of higher EOCT/GHSWT scores during block or traditional scheduling when considering demographic variables student gender, race, or SES. No experimentation occurred as the study relied on historical data. Both high schools were examined individually; comparing the five EOCT's and the GHSWT under the block schedule during the 2011-2012 school with the same exams under the 7-period traditional schedule during the 2012-2013 and 2013-2014 school terms. The design comparison for this quasi-experimental study was a 2-group non-random selection design comparing each school to itself rather to each other. Each school is very different in terms of student demographics; therefore the examination with each school is imperative. This study used quantitative statistics so that clear concrete data is used to show evidence to which schedule students performed best on from a standardized assessment view. In addition, descriptive statistics was used including means and standard deviations. A multi-way ANOVA with 6 factors (schedule, sex, race, SES, classification, and school year) was used to determine if a significant difference existed between the students instructed on a 4 x 4 block schedule and students instructed on a seven-period day traditional schedule. The multi-way ANOVA allowed for testing of interactions among predictors. The interactions helped show if any specific sub-groups benefited more operating under one scheduling model than another. After an in-depth study and analysis of a Test score comparison between block and traditional scheduling of two schools and twelve subject areas, the results indicated a significant difference in mean scores by school year in two of the twelve subjects. Writing scores at School 1 were significantly different indicating the change from block to a traditional schedule was a positive move, and Biology scores at School 2 were significantly different indicating the change from block to a traditional schedule was a positive move. However, at both schools in all twelve areas, the overall mean test score slightly increased each year indicating the possibility the move from block scheduling to a more traditional scheduling model could be positive given more time.

INDEX WORDS: Block Scheduling, Traditional Scheduling, Student Achievement, and

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DEDICATION

This work is dedicated to:

My mother, Betty Waterman who has always encouraged me to work hard, lead by example, and to never give up on your dreams and aspirations;

My step-father, Robert Waterman – Thank You for always telling me how proud you are of me. Those few encouraging words kept me hungry for success;

My father, Ernest Ford who was always was proud of me in all my endeavors.

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CHAPTER 1

Introduction

There is a major problem in American Schools, particularly in graduation rates in the state of Georgia. Schools in Georgia are graduating students at a rate of 67%, with only two states having lower graduation rates than Georgia. Classroom instructional time has an impact on graduation rates (Good, 2014). How teachers use the time allocated is the only thing that is controlled 100% by the schools and directly affects students' interest in and attitudes about staying in school and graduating on time. Educational stakeholders need students graduating from Georgia schools either college or career ready and currently only two out of three students are leaving high school with a diploma (Georgia Department of Education, 2012). Public high school graduation rates have brought about conversations from community members and key interest groups (Clarke, Madaus, Horn, & Ramos 2000; Manzo, 2008). The impact of these demands became more prevalent after the *Nation at Risk* publication in 1983. This was the defining moment in our schools as educational reform became important to politicians running on the nebulous "reform" platforms; to citizens who were listening to the political rhetoric; and to the large companies churning out educational reform strategies and ideas hoping to cash in on the nation's desperation.

School systems have striven to increase student achievement for many years. In fact, history indicates schools have manipulated school schedules in various ways to increase student achievement (Rettig, 1999). School administrators have used a variety of schedules to manipulate the school day to help students increase test scores and overall grades; however, throughout this process, the most widely used schedules include the 4x4 block schedule and the traditional six or seven period day.

Guber and Onwuebuzie (2001) indicated until the 1960's schools relied heavily on the traditional schedule and most students experienced the typical six, seven, or eight-period day, often times with a "study hall" being one of the periods. In the late 1980's and early 1990's schools began to experiment with scheduling to meet the needs of the student. J. Loyd Trump led an initiative for school systems to challenge students and accommodate their various needs by adjusting the schedule (Ruber & Onwuegbuzie, 2001).

A traditional schedule was designed so that students can attend 6-8 classes per school day lasting 45-50 minutes for each class. Over the years, graduation requirements have changed and students have been encouraged to take more classes as teachers have been charged more heavily to teach students differently based on their needs (Rettig & Canady, 1996). The 4 x 4 block schedule began to establish its presence in the early 1990's in an effort to reach the needs of more students. The 4x4 block schedule divides the school year into two semesters allowing students to enroll in four courses in the fall and four courses in the spring. Trenta and Newman (2002) indicate the four courses offered in a 90-minute setting for 90 days is equivalent to the traditional year long courses of 50-minutes for 180 days. The 4x4 block schedule is designed for teachers to change elements of a lesson every 12 – 15 minutes offering a variety of teaching strategies for the learner. The teacher can use this extended time in the class setting to differentiate the learning for each student and his/her needs (Hannaford, 2000).

The purpose of this study was to examine two high schools in rural South Georgia and study the achievement levels on the five Georgia End-of-Course Exams and the Georgia High School Graduation Writing Test.

Since this time, schools have continually looked for ways to raise their graduation rates. Pressure arises from outside sources when the economy is not doing well, and high school graduation rates have dropped. Two specific areas have brought attention to high schools:

1) How the United States compares to other countries.
2) How well schools are preparing students for the world of work.

Unfortunately, the United States was lagging in both areas, and public education is expected to be the agent of change, charged with bringing about positive results. Many schools tried different scheduling approaches, hoping to see positive changes as a result of these new schedules. However, adopting a new schedule can be difficult for any school. The students and teachers were usually accustomed to a certain schedule, and change can sometimes give a perception that something is wrong with what the school is currently doing.

Scheduling in schools (and therefore, changes in scheduling scenarios) has been around for some time. Change really began to take a turn in 1994 when the National Education Commission on Time and Learning developed a surge on education to move from a traditional school schedule in high school to a block schedule (National Education commission on Time and Learning, 1994). As time passed, more and more schools adopted some type of block or modified block schedule. By 2006, researchers reported about "fifty percent of high schools in the United States were on some type of block or modified block schedule" (Dexter, Tai, & Sadler, 2006, p. 23).

There was many reported advantages to a block or modified block schedule, but there are drawbacks as well. It was essential to examine not only the aspects of each scheduling model in high school, but also to examine the test results associated with each schedule. The exposure to content in class may be increased in a block setting, but the teacher practices may remain the same, and the same may be true when moving from a traditional to a block setting. If this happens, negative effects could stem from an effective teaching practices rather than a scheduling model, and the resulting fallout could adversely affect the success of the school (Barrier-Ferreira, 2008; Graham & Neu, 2004). The purpose of this research was to examine how block scheduling and traditional scheduling models differ in achievement levels on the five Georgia End-of-Course Exams and the Georgia High School Graduation Writing test at two high schools in rural South Georgia.

Statement of the Problem

The No Child Left Behind Act of 2002 brought about a tremendous amount of pressure for schools to perform at adequate levels in order to continue receiving funding and to gain positive ratings for school improvement. Since 2002 school systems and individual schools have been challenged to reach higher levels each year under Adequate Yearly Progress (AYP) (Darling-Hammond, 2007). AYP was used as the measuring tool for schools in the State of Georgia from 2002 until 2012. In 2012, the Georgia Department of Education transitioned to a new system of accountability entitled the College and Career Readiness Index (CCRPI). Georgia was one of 10 states granted a waiver from the federal No Child Left Behind Act in February 2012. The Index helped school systems communicate with parents and the public on how schools are performing in a more comprehensive manner than the pass/fail system previously in place under Adequate Yearly Progress (AYP) (Georgia Department of Education, 2012). Therefore, as schools transitioned into a new accountability system, schedules came to the fore-front of decisions for high school administrators and board level employees.

To date, there were mixed reviews on the success of block scheduling at the high school level. Research has indicated that schools have tried several models of scheduling to accommodate their student body and community. There was still much indecision on what schedule works the best. Veal and Schreiber (1999) conducted studies comparing block and traditional schedules in relation to student achievement and found them to be inconclusive. Schools have attempted to emphasize higher order thinking activities under the block schedule, as well as engage students in more content, thus leading to higher student achievement; but again, the results were inconclusive. Others have attempted to trend back to the more traditional schedule, only to find student achievement successes or failures were indecisive. For my community, the two high schools utilized block scheduling from 1998 to 2012. After having transitioned back to traditional scheduling, there was a desire to determine which schedule works best in terms of the assessments required by the Georgia Department of Education.

The purpose of this research was to examine how block scheduling and traditional scheduling models differ in achievement levels on the five Georgia End-of-Course Exams and the Georgia High School Graduation Writing test at two high schools in rural South Georgia.

Research Questions

Administrators needed to find out which instructional schedule works more effectively in terms of student achievement in the areas of English, Writing, Science, and Social Studies as evidenced on the five State End-of-Course Exams. The researcher compared student achievement using the type of schedule as the independent variable. Thus, the following research question will guide the investigation:

1. Was there a difference in academic achievement as measured by the five Georgia end of course examinations and the Georgia High School writing test based on scheduling format, block schedule or traditional schedule?
2. Was there a difference in academic achievement as measured by the five Georgia end of course examinations and the Georgia High School writing test based on scheduling format, block schedule or traditional schedule in the areas of race, gender, and SES?

Significance of the Study

This study was of high importance because some high schools transferred to a block schedule in the early 1990's in an attempt to improve student achievement. Over the past few years, the trend has changed. High school and district level administrators have begun to reevaluate scheduling and its effect on student achievement. Although there has been research on the effects of both block and traditional schedules, most current research related to perceptions of teachers and administrators. This study focused on two different scheduling models – block and traditional – and their impact on student achievement. The audience for this study was teachers, students, parents, concerned community members, and any aspect of the general public with an interest in the education of young people. The ultimate goal was to provide information directly related to student achievement evidenced through the level of scores on the five Georgia End-of-Course Exams and the High School Graduation Writing Test. The following courses that carry a state examination was not being used because the curriculum changed while the researcher was conducting this study; 9th and 10th grade mathematics, and economics. The results of this study aided board level employees as well as school level personnel in the decision making process related to instruction and achievement. The results of this study also benefited school leaders who were going through the process of making decisions on whether to change from one schedule to another.

Methods

This quantitative investigation determined if there is a difference in achievement on the five State End Of Course Exams and the Georgia High School Writing Test based on the schedule a student was educated within. This research was conducted in two South Georgia schools and was ex post facto in nature. No experimentation occurred as the study relied on two years' data collected on 4x4 block schedule and two years' data collected on seven-period day schedule.

Population

Two high schools from the same county were a part of this study. These schools were located in rural South Georgia, where the research will took place. The demographics of the schools reflected two distinctly different socio-economic profiles. School 1 has a population consisting of 1805 students, comprised of 75% White, 24%

Black, and 1 % other. School 2 has a population consisting of 1456 students, comprised of 88% White, 10 % Black, and 2% other. Both high schools had populations that were from high, middle, and low socioeconomic backgrounds. School 1 had more middle to low socioeconomic students and School 2 had more high and middle socioeconomic students, without many students categorized as lower socioeconomic. Both high schools received populations from three middle schools consisting of similar types of populations found at the high schools.

Measure: Data Collection

The researcher sought information for this study through EOCT scores from the five required state end of course exams and the GHSWT administered by staff members at the high school setting. The EOCT courses were mandated by the Georgia Department of Education and were an integral part of the College and Career Ready Performance Index (CCRPI). There were a total of eight courses that required a State EOCT, but Math I, Math II, and Economics transitioned curriculums during the change in schedules. Therefore, those three EOCT exams were not used for this study.

Measure 1: The researcher gained permission from the Assistant Superintendent in charge of Curriculum and Technology for the school system in order to use the EOCT scores for students who took 9th Grade English, 11th Grade English, 9th Grade Biology, 10th Grade Physical Science, and 11th Grade U.S. History from 2011-2012, 2012-2013, and 2013-2014. The researcher compared each subject area listed above from the 2011-2012 school year to the 2012-2013 and 2013-2014 school years within School 1 and then within School 2. Each school’s achievement levels were measured against its own scores from different years. School 1 was not being measured against School 2.

Measure 2: In addition, the researcher gained permission to use the Georgia High School Writing Test (GHSWT) scores for students from 2011-2012, 2012-2013, and 2013-2014 school years. Also, the researcher gained approval from the Institutional Review Board (IRB) from Georgia Southern University. The researcher gained access to the EOCT and GHSWT score information from the System Testing Coordinator for the school system.

The researcher gained access of records from the database in Infinite Campus, the county's student information system and export data into a Microsoft Excel file. The results from each exam were recorded by the State of Georgia and were downloaded into the Infinite Campus Information System. Access of the scores was accessed by teacher and subject area for both school terms and both high schools. Scores from the 2011-2012 school year reflected EOCT and GHSWT scores on the 4x4 block schedule. EOCT and GHSWT scores from the 2012-2013 and 2013-2014 school years reflected scores on the traditional seven-period year-long schedule. Students were identified by numbers, and all information pertaining to the identity of an individual student, teacher, or school were removed to ensure the anonymity and confidentiality of all subjects involved.

The researcher examined students' scores from all levels. Special education, honors students, advanced placement students, and regular students were not examined in this research project. The researcher also examined and broke down test scores for African American students, White students, and students receiving free or reduced lunch. The data from 2011-2012, 2012-2013, and 2013-2014 was statistically compared using ANOVA calculations to determine whether a significant difference existed between the five EOCT and GHSWT scores of those on a traditional schedule versus those on a block schedule. The data was disaggregated into spreadsheet form so that the researcher could examine scores measuring each school's demographic population as well.

Assumptions of the Study

The following assumptions underscored this research study. First, quantitative research was used to examine the relationship among variables. The assumption was that bias was protected and the researcher was able to generalize and replicate the findings (Creswell, 2009). A second assumption was that the evaluation instruments used to gather data on student performance was both valid and reliable. The State End-of-Course Exams (SEOCT) have been used since the passing of the A+ Educational Reform Act of 2000, which mandated the State Board of Education adopt end-of-course assessments for core courses to be determined by the Board. The EOCTs served as a student's final exam in the associated course with the score counted as 20% of the student's final grade for the course. In 2011-2012, the EOCT became Georgia's high school accountability assessment as part of the College and Career Ready Performance Index (CCRPI) (Georgia Department of Education, 2012). The Georgia High School Writing Test (GHSWT) in its current form was developed in 2005 and piloted in 2006 in order to conform to the new GPS Standards. Since 2007 students in the eleventh grade participated in the Georgia High School Writing Test in its current form and, as has always been the case, must have passed the GHSWT to earn a regular education diploma (Georgia Department of Education, 2012). Quantitative research was used to examine the relationship among variables. For this study, the assumption existed that the researcher did not have a pre-existing opinion on the outcome – even with the researcher's familiarity with the two schools – and the researcher was able to generalize and replicate the findings.

Delimitations

The study was delimited to Georgia public high schools because of the researcher's familiarity with this level of school and design of testing and assessment in Georgia public schools. The results of this study were generalized to educators who were (a) educators in 9-12 high schools, and (b) high schools in the state of Georgia (Leedy, & Ormrod, 2010).

Limitations

This study had a number of limitations that were addressed. First, the participants in the study was limited to students in grades 9-12. Second, the scores used in the study were from the first and second transition years to a traditional schedule from a block schedule. Third, the two high schools used in the study had very different student subgroups. These possible subgroups included race, student stability, special education status, and economic status. Finally, scores included in the study were from two transition years from block scheduling to a traditional seven-period school day at the high school setting. Results were not compared to a middle school setting.

Key Definitions

The following definitions of terms apply to this study.

4x4 block schedule: A type of school schedule where students took four classes each semester thus equaling eight semester classes in one year. Each 4 x 4 block schedule class was 90 minutes long.

Common Core Georgia Performance Standards: The Common Core Georgia Performance Standards (CCGPS) provided a consistent framework that prepared students for success in college and/or the 21st century workplace. The College and Career Ready Performance Index or CCRPI was a comprehensive school improvement, accountability, and communication platform for all educational stakeholders that will promote college and career readiness for all Georgia public school students.

End of Course Test (EOCT): Georgia Law mandates that the State Board of Education adopt end-of-course assessments in grades nine through twelve for core subjects to be determined by the State Board of Education. There were seven assessments. Assessments were given in the following courses: Mathematics II: Geometry/Algebra II/Statistics, United States History, Economics/Business/Free Enterprise, Biology, Physical Science, Ninth Grade Literature and Composition, and American Literature and Composition (Georgia Department of Education, 2012).

Georgia High School Writing Test: Students wrote a persuasive essay on an assigned topic. Their essays were read by at least two trained professionals who independently judge each essay on four qualities or domains of effective writing: Content/Organization, Style, Conventions of Written Language, and Sentence Formation. In the overall score for an essay, Content /Organization counted twice as much as the other three domains (Georgia Department of Education, 2012).

Traditional Schedule: A type of school schedule designed for students to attend the same consecutive classes through the school year. Students were enrolled in seven 50-minute classes per school year.

Chapter Summary

The study focused on whether there was a difference in student performance under different class schedules using the five Georgia End of Course Tests and the Georgia High School Writing Test. The two schedules were 4x4 block scheduling and a traditional 7-period schedule.

The first schedule measured in this study was the 4 x 4 block schedule, which consists of students enrolled in four 90-minute classes for a ninety day semester. At the end of the first semester, the students enrolled in four different 90-minutes classes for an additional ninety day semester. The second was a traditional schedule, which was a schedule that allowed students to take six to seven fifty to fifty-five minute classes all year. These two formats were central to this study.

Educators and outside interest groups usually agreed that instructional focus was the most important aspect of schools, and the schedule under which schools operate became the vehicle or plan to help educators reach the goal of strong instruction. A clear school schedule enabled staff members to plan with focus and created goals supported by instruction and resources. In conclusion, the time used inside the school each day focused on instruction was a crucial factor that affects the success of students and their education in the United States and, in this study, the state of Georgia. Leaders of school districts and educational reform groups continued to visualize and implement new ideas concerning the organization of time within a school day in order to help students perform at higher academic levels to compete in this ever diverse and changing society. The observations and dialogue among school staff, school leaders, and other interested school stakeholders derived from the school transitioning from block scheduling to a traditional seven-period day revealed insights into the successes and failures of each type of schedule and may have contributed to the body of literature concerning each. More importantly, in this world of instructional accountability and academic success through standardized testing, it was the goal through this research to gain valuable information from the comparison of test scores from each of the two high schools in similar areas. The results from the comparison in this study uncovered information that would be helpful for future scheduling designs. The outcomes of this study was also beneficial to all educational stakeholders who made decisions regarding scheduling at the secondary level. This may have included: school administrators, school board members, superintendents, teachers, students, and parents.

CHAPTER 2

REVIEW OF SELECTED LITERATURE (AND RESEARCH)

This chapter included a review of empirical research on block scheduling and its impact on schools across the United States. The review of literature in this chapter covered several areas within the scope of scheduling and the school day. The sections that were presented were as followed: types of schedules, (block schedules, traditional schedules, modified block schedules), advantages and disadvantages of block scheduling, educator perceptions of block scheduling, student perceptions of block scheduling and block scheduling overall impact on student achievement.

Search Process

The researcher used a variety of resources throughout the search process to gain empirical research on block, traditional, and modified-block scheduling. The majority of the literature for this review was obtained from electronic sources via access through Georgia Southern University. The university's online library system provided access to the Educational Research Information Clearinghouse, (ERIC) and ProQuest (database for arts and humanities, natural sciences, and social sciences). The key descriptors used during the search was, "block scheduling", "scheduling in high schools", "success in block scheduling", "teachers and the block", "student achievement and scheduling", "alternative scheduling in high schools", "perceptions of block scheduling", "traditional scheduling", "modified-block schedules", and "negatives of block scheduling".

The research material for this literature review was located in educational journals, doctoral dissertations, and books accessed through the university system access loan services located at Henderson Library at Georgia Southern University. Secondary sources were also found for use through access of empirical articles and dissertation reference sheets online. The selected research was used from journals, articles, and studies from 1980-Present.

Introduction

School systems have strived to increase student achievement for many years. One way they have attempted to do this is by adjusting the class schedule. In fact, studies have indicated schools have manipulated school schedules in various ways to increase student achievement (Rettig, 1999). School administrators have used various scheduling models to manipulate the school day to help students increase test scores and overall grades. Although many models are used, the most widely used schedules with consistency include the 4x4 block schedule and the traditional six or seven period day.

Guber and Onwuebuzie (2001) indicated until the 1960's schools relied heavily on the traditional schedule and many students experienced this type of learning schedule while in school. In the late 1980's and early 1990's schools began to experiment with scheduling to meet the needs of the students. J. Loyd Trump led an initiative for school systems to challenge students and their needs through a variety of schedule formats (Ruber & Onwuegbuzie, 2001).

A traditional schedule was designed for students to enroll in six, seven, or eight courses per school term lasting 45-50 minutes per class for 180 days. Over the years, graduation requirements changed and students were encouraged to take more classes and teachers were charged to teach students differently based on their needs (Rettig & Canady, 1996). The 4 x 4 block schedule began to take fire in the early 1990's in an effort to reach the needs of more students. The 4x4 block schedule divided the school year into two semesters allowing students to enroll in four courses in the fall and four courses in the spring. Trenta and Newman (2002) indicated the four courses offered in a 90-minute setting for 90 days is equivalent to the traditional yearlong course of 50-minutes for 180 days. The 4x4 block schedule was designed for teachers to change gears every 12 – 15 minutes offering a variety of teaching strategies for the learning. The teacher used this extended time in the class setting to differentiate the learning for each student and their needs (Hannaford, 2000).

Both schedules continued to be utilized by school systems across the United States; however, there were questions unanswered in the area of measuring how students are performing on state assessments with the implementation of the new Career and College Performance Index (Georgia Department of Education, 2012). The new CCRPI took the place of Adequate Yearly Progress (AYP) and in a response to the changes; Georgia adopted a series of standardized test for students in grades nine through twelve as a measuring point of student achievement. These exams were known as the Georgia End of Course Tests (EOCTs) (Rufus, 2007). The EOCT's were first introduced in 2001. The score from each of the eight exams counted 20% towards the student's final grade. Although a passing score on the EOCT was not required for graduation, the state of Georgia continued to administer the exams and the school system of South Georgia high schools within this study relied heavily on the scores as a measure point for student achievement and teacher accountability in the area of student success. Georgia has also continued to administer the exams despite the different schedules school systems may have adopted.

There has been a tremendous emphasis placed on scheduling for many years. School reform leaders have tried to seek out the appropriate formula that works best to increase student achievement (Todd, 2008). The schedule that works best was still up for debate after years of research. Some have argued that the more time a student spends in class, the better they will be academically while others have debated the point that less classes, with more contact hours at one time is what's best. Meanwhile, others have argued, less class time in one setting, meeting more frequently was better for students academically. For example, some students performed better when they met fifty minutes per day for one hundred eighty days, versus meeting for ninety minutes for ninety (Education Commission of the States, 2010). Prior to the early 1900s, secondary schools operated under flexible plans. Teachers offered subjects in different formats, taught curriculum on different days, and used what we call today differentiation in the classroom. The College of Entrance Examination Board adopted a Carnegie unit in 1909 to streamline education and create common ground in the schools. Class segments during this time consisted of students being instructed in a forty to sixty minute time frames. This drive to standardize education became prevalent throughout schools in the United States. The state school boards were seeking uniformity and a "one size fits all" approach which would educate a mass of students efficiently. Traditional scheduling remained intact for about 40 years until modular scheduling came on the scene in the 1950s. In modular scheduling, the school day was broken down into 10-20 minute modules, with students being scheduled into multiple modules, depending upon the time frame needed for the course. This flexible scheduling allowed more options for students, but it also left students with more "down time." Most schools used this flexible model until the early 1970s and then returned to the traditional segment scheduling to avoid supervision issues as well discipline issues among students. Once again in the 1980s, the status of scheduling came to the forefront and was seriously disputed. Factors such as the lack of in-depth learning, lecture style teaching, and the lack of curriculum integration led to the emergence of serious changes in scheduling (Hackman, 2004).

One of the reasons school reform came to the fore-front of our nation in the 1980s was the publication by the National Commission on Excellence in Education of *A Nation at Risk*. The main focus of this report indicated schools must ensure that time within the school day is used effectively and time spent on core academic subject matter is increased. However, schools did not change time schedules and remained on a traditional schedule for many years. It was not until the early 1990s when the National Commission on Time and Learning introduced block scheduling as the way to increase student achievement that schools began to change how time was allocated for learning within the day (Evans, Tokarczyk, & Rice, 2002).

Since the huge push for reform in the 1980s, a great deal has changed in schools in the US. The majority of schools today operate differently than they did 25-plus years ago. Previously, teachers had more freedom to conduct their class and cover their curriculum as they saw fit. For some time, many teachers have had pacing guides, strict curriculum guides, and federal and state mandates that outline the classroom curriculum coverage. Education is the key to success for an individual trying to fulfill the American Dream. The United States has laws in place that govern school policies and has procedures that allow states to operate under the umbrella of the federal government. Funds are attached to those laws that help states and local boards of education financially operate. The public schools of the US sets goals to educate all students regardless of race, gender, disability, or the state of economics from which he or she has come (Anyon, 1997).

Change in public schools has been shaped by the federal government as the government imposes amendments and laws based on the experience one receives while at school. The *National Defense Education Act* (1958), incorporated scholarships along with student loans for students to further their education so that students could compete in a global society. In 1958, competition with the Russians was prominent in US society, politics, and minds. Schools and other stake holders began to take a keen interest in education within the United States (Blocker, 2000). Early in the 20th century, education has been restructured frequently again based on policy from the federal government that felt change was necessary for students to be successful. Research indicates over the years that reform comes in the fashion of time, strategies of instruction, and in the case of this study, the bell schedule on which schools operate (Howard, 1997).

For years, educators, parents, and community members alike have expressed concerns that students are not meeting higher standards and are performing with minimal proficiency on demanding high-stakes tests. How schools set up schedules based on times allocated to them vary from school to school. Scheduling models and the day-to-day setup of classroom time have varied over the years but also have been somewhat consistent up until the 1990s in that the traditional schedule was widely used (Canady & Rettig, 1995). Over the past several decades, teachers have been using whole-group instruction that in a conventional (traditional) setting should meet the needs of all students. The traditional teacher-led instruction typically reaches one style of learner without taking cultural backgrounds, economic status, or disability into account. *Prisoners of Time* (1994), sums it up best. Students have been learning under a model attached to time frames within a school day for over 150 years. Teachers had time allocated to them for coverage of subject matter and the above average student and the brightest student rise to the occasion and the others struggle to succeed and may even drop out. The most appropriate schedule that works the best has been a controversial topic for many years. In the early to mid 1980s, the traditional schedule was under great scrutiny in the secondary school arena. The 1980s brought about a debate over the entire secondary curriculum and the emergence of block scheduling brought about much scrutiny over the schedule and how curriculum was delivered (Goldman, 1983). There was an abundance of research articles in national journals presenting the advantages of block scheduling over traditional scheduling and mirror the change in the way society operates. Society sees schools operating like businesses in some ways. What the literature seems to express is that block scheduling did not guarantee teachers more time to plan for lessons and having fewer students does not automatically lead to higher achievement. The approach to the schedule, whether block or traditional, was in the hands of the teacher and how he or she plans for the instruction. The delivery of the lesson had just as much impact as the schedule itself and research on block could not guarantee those results solely based on a schedule – a block of time if you will (Bowman, 1998).

Since the early 1990s, schools have shifted from a traditional school schedule to a block schedule and in some cases to a modified block (Canidy & Rettig, 1995). Most recently, the *No Child Left Behind* initiative has challenged school administrators to make adjustments to bell schedules and allocated classroom time to fit the needs of all learners. The research indicated that about 50% of United States secondary schools are operating on some type of block or modified-block schedule, depending on the needs of the school and students (Dexter, Tai, & Sadler, 2006).

Types of Schedules

There are many types of schedules in operation in schools across the nation. However, research indicated schedules were usually divided into four main categories: traditional six, seven, or eight period schedules, 4x4 block schedule, modified block schedule, or a trimester schedule, sometimes referred to the Copernican Plan (Trenta & Newman, 2002). Students in a traditional schedule met six, seven, or eight times a day with each period lasting 45-55 minutes per class. Under the seven-period traditional model, teachers would educate 120-150 students per day and keep those same students for the entire school year. Seat time under the operation of a seven-period day would be approximately 9000 minutes of student – teacher instructional time. Students usually took four to five academic classes and two to three non-academic classes depending on the year of the student, state requirements, and local procedures (see Table 1).

Table 1:

Student Schedule in seven-period Traditional Schedule (50 minutes per day – 180 days)

Period	**Class**
1st	English 9
2nd	Personal Fitness / Health
3rd	Coordinate Algebra
4th	Biology
5th	World History / Lunch
6th	Band
7th	Intro to Graphics

Students in a 4x4 block schedule met 4 times per day with each period lasting 75-90 minutes per class for 90 days. Teachers normally see approximately 90 students per day operating under this model. Teachers would transition those students at the end of the semester to four other classes and gain another 90 students for the 2nd semester. Students under a 4x4 block model complete four classes per semester and take an additional four classes the 2nd semester totaling 180 days of school. Students would accumulate 8100 minutes of seat time under the 4 x 4 block model. The block schedule model was set up for students to take 2 -3 academic classes per semester with elective courses added in within the current schedule (Deuel & Stoyco, 1999) (see Table 2).

Student schedule in a 4 x 4 Block Schedule (90 minutes per day – 90 days)

Table 2:

Block	**Class 1st Semester**	**Class 2nd Semester**
1st	English 9	World History
2nd	Personal Fitness / Health	Intro to Graphics
3rd	Coordinate Algebra / Lunch	Band
4th	Band	Biology

Students in a modified block schedule or in some cases referred to as A/B block scheduling meet four times on alternating days totaling eight classes for the entire school year. Teachers would have approximately 200 students for the entire year seeing each class on an alternating basis. Seat time under the modified block may vary depending on the number of times each block is assigned to the schedule, but it should consist of approximately 8100 minutes of instructional time. The modified block schedule allows students to take 8 classes in a block setting of 75-90 minutes per day attending each class on alternating days throughout the 180 day school year (Kienholz, Segall, & Yellin, 2003) (see Table 3).

Table 3:

Student schedule in a Modified Block Schedule (90 minutes per day – 180 days)

Block	**A Day**	**B Day**
1st	English 9	World History
2nd	Personal Fitness / Health	Intro to Graphics
3rd	Coordinate Algebra / Lunch	Band
4th	Band	Biology

Approaches to Scheduling

School districts across the US are and have been researching scheduling models for many years so that each school's students are served in an effective and efficient way. The needs of students were the most important aspect of teaching and learning. Administrators and key faculty and staff members have debated over which schedule is best for schools and its students. Teacher morale and perceptions play a key role in the buy in process that school administrators need for support in any schedule change and implementation (Schultz, 2011). The bell schedule within the school that guides the time frame of classrooms may or may not have a direct impact on the learning that takes place. The National Education Commission on Time and Learning, 1994, challenges that all students can learn all they need to know within a 180 day school year. The commission also suggests that the United States Education System is flawed because time is uniform for everyone. The society our students live in today requires different avenues to learning than what was done in the past. The American traditional schedule was built on students learning information every day – all year long. The United States had a strong enterprise in education with that mindset. Is it reasonable to question the old system even if new and better systems are in place? The schedule that accommodates the child to succeed has been argued for years. Teachers and students operate under constraints of time, bells, and schedules with little wiggle room for other tasks (National Education Commission on Time and Learning, 1994).

Block Scheduling

The restructuring of high schools came about in the late 1980s asking for change in instructional practice, the content teachers teach, and the many experiences students have an opportunity to be a part of in the school day. Canady and Rettig clearly acknowledge that time is not being used effectively through a traditional schedule, asserting that block scheduling can be the change we need in high schools (Canady & Rettig, 1995). The traditional schedule has been reported to be difficult for students and teachers to get the job done in a 50 – 60 minute time frame. Being able to change the way the teacher instructs, dive more deeply into the content, and make the classroom experience a little different from before may not be able to be done in short doses 180 times per year (Jenkins, Queen, & Algozzine, 2002). Block Scheduling appeared on the scene in the late 1980s as one form of an alternative scheduling model to better fit the needs of students and create opportunities for teachers to exhibit teaching strategies from different angles so that students are supported. The traditional schedule presented several problems, and researches began to seek other scheduling alternatives to reach academic success. Students needed more time to expand on the content and master the material to new levels of academic depth. Researchers indicated block scheduling extends the time teachers have to better use a greater variety of instructional strategies. The learner's needs are addressed in more depth in the block schedule rather than the traditional schedule (Hamdy & Urich, 1998). Block scheduling was introduced to create an environment of uninterrupted segments of learning. This change has led to over 30% of all schools operating under some type of block schedule and 40% of all high schools using block scheduling as their schedule of choice (DiRocco, 1998). Does block scheduling make for a better classroom for teachers and students? The extra time allocated in a 4 x 4 block schedule should give teachers more time to engage students in various activities reaching many different types of learners. Others claim that in an ever-changing world devised of project-based and team-based assignments in the work place, block scheduling allows for students to participate in team or group activities more and engage in project based assignments (Evan, Tokarczyk, Rice, & McCray, 2002). A key study comparing block scheduling and traditional scheduling and its impact on student achievement was carried out by Lawrence and McPherson in 2000. Academic achievement is a very important aspect of school and, the impact one schedule may have over another giving the advantage of academic achievement to the student can be a driving force in schools (Lawrence & McPherson, 2000). Students today face new challenges and obstacles that their parents and grandparents did not have to deal with. The schedule that worked 30 years ago may not be best suited for the student of today (Khazzaka, 1997). Even after 18 years of operating on this schedule, there are still schools today using this same model. Lawrence and McPherson attempted to gain an understanding of which schedule impacted student achievement the most – block or traditional scheduling. The study consisted of data from Algebra I, Biology, English, and United States History. The comparison would examine the two schedules and the impact the schedule has on student achievement. The perspective of how time is allocated within the school day during instruction had been around since the early 1990's (Rettig & Canady, 1997). This study was conducted in North, Carolina and cluster sampling was used to select the sample for the study. The study compared the two groups in the four academic areas listed above and the results indicated the students receiving instruction on the traditional schedule scored higher in the areas of Algebra I, Biology, English 1, and United States History (Lawrence & McPherson, 2000). The results were different than the perceived outcomes prior to the study being conducted (Carroll, 1994). However, some studies indicated final grades for the courses were higher on the block rather than the traditional schedule, although course grades are not necessarily a good indicator of achievement. Limitations to the study included time spent on the block by students and teachers transitioning into the block with a lack of staff development to be highly prepared to create the proper learning environment with appropriate instructional strategies required for block to be a successful schedule. The findings of this study indicate that block scheduling alone cannot fix all instructional issues. Block scheduling is one piece of the puzzle of educating students at a level that produces excellent results. Recently, critics have argued that the block scheduling move is a fad, and school officials are guilty of jumping on the bandwagons of the current trend. There is not much empirical evidence that supports block scheduling enhancing students' grades and academic achievement. Is there any truth to the notion block scheduling creates an environment of less discipline, more concepts being taught or higher test scores? The truth is there are very few empirical studies that suggest the student enrolled in a block schedule out performs the student enrolled in a traditional or modified block schedule (Bowman, 1998).

There is no doubt that the type of schedule implemented is similar to an empty vessel. The way in which the teacher fills the vessel is the key to academic success, not necessarily the schedule or route it is on. Teachers want freedom in the classroom so that the implementation of the curriculum can be somewhat flexible to the wants of the teacher and the needs of the student. Sigurdson directed a study in 1981 that gave teachers a block of time and allowed each of them to use any type of flexibility to arrange classroom times to meet the needs of the students. Although the teachers favored the experience, there was no evidence of data that contributed to the success of the block / modified block program (Sigurdson, 1981).

Perceptions of Block Scheduling

Data was compiled from a study conducted by Evans, Tokarczyk, Rice, and McCray, (2002) consisting of three school districts where the 4 x 4 block schedule was used with a slight change for certain subject matter. Those courses included band, chorus, advanced placement classes and vocational education. The three schools used in this study surveyed teachers, administrators, and parents seeking knowledge and data after the implementation of block scheduling in their schools. All three schools were in the New Jersey and included schools from urban, suburban, and rural areas. The results from the survey would hopefully lead to outcomes in several areas: (1) changes in the avenue in which teachers teach. What instructional strategies are being used and which are working best; (2) have students experienced a difference in the curriculum as a whole and the impact it has on their learning; (3) does student achievement improve under a block scheduling approach in the three high schools within this study; (4) is student behavior impacted based on the scheduling model; (5) are students, teachers, and parents satisfied with the scheduling model implemented (Jones, 1997). This study of three school sites proved to be similar in many categories. The results of the study included:

- Teachers are being creative and using the extended time for each class to expand the knowledge of students through project-based assignments and deep thought-provoking activities.
- Students also have an opportunity to select more courses on the block schedule versus the six or seven in a traditional schedule.
- Students showed increases in student achievement as evidenced on standardized exams.
- There were more students making honor roll on the block than on the traditional schedule.
- Behavior reports indicated students were disciplined less and the fewer number of transition times were factors in those numbers.
- Teachers, parents, and students were satisfied about the change to block and the data each were receiving from the change.

It is important to note, this study conducted by Evans, Tokarczyk, Rice, and McCray in 2002 came from a small sample of schools, but the results were very similar.

Homework was another positive ingredient to block scheduling from the teacher's perspective. Students in a block schedule tend to have less homework that is completed at home. Typically, students having 4 courses rather than six, seven, or eight on a traditional schedule have less core subjects that require homework. At-risk students benefit from only having to concentrate on two or three core subjects each semester. Some teachers indicate as well that the extended time in class allows for homework help to students who may or may not be able to stay for tutorials. Others believe it to be downfall because of the homework time takes away from in depth activities that are more project based (Childers & Ireland, 2005).

Block Scheduling and Student Achievement

Ultimately, school administrators and district personnel were concerned about the instruction that takes place in the classroom. The avenue in which this occurs usually had a direct impact on the success of the child. Reform education has been around a long time and performance goals are driven by student achievement (Eisner, 2001). Mixed results have been reported by researchers concerning the success of block scheduling and its evidence of student achievement from data (Corley, 2003). There has been an ongoing search for many years on ways to raise student achievement and some researchers have proclaimed that a longer school day or longer class periods may help increase student achievement (Gullatt, 2006, Silva, 2007).

A body of research suggested that block scheduling had a positive impact on student achievement. Block scheduling offered teachers an opportunity to spend quality in depth time with students gaining a better understanding of the content (Flocco, 2012). Studies completed by McGorry and McGorry (1998) established evidence that students operating under the block model perform better than students attending classes in a traditional setting. In 1998, the Georgia Department of Education argued the benefits of block declaring there are not differences in student achievement among the two schedules. Initial implementation of the block or traditional schedule may show increases in achievement, but prolonged implementation of either schedules signifies no real significant data advantage. Data being analyzed came from standardized exams (Gruber & Onwuegbuzie, 2001).

Another researcher that suggested positive outcomes form block scheduling was Flocco, (2012) in his research conducted at Montclair Kimberley Academy in New Jersey, insisted that the block schedule enables teachers to challenge students academically and students will have additional opportunities to seek help from the teachers working under the block schedule. Flocco suggested in his study that students were having a difficult time grasping an in-depth knowledge base of the subject matter when the instructor is only skimming the top of the subject matter and there was little time for both students and teacher to stop and reflect on their learning. His new research focused on the stress levels of students in traditional schedules compared to the level of stress on a block schedule, and he asserts that a deeper learning of the content leads to reduced stress on students. Montclair Kimberley Academy operated under a traditional schedule in 2003 and under a block schedule in 2006. Parents worried the rigor would be less on the block. Flocco's study results indicated that students were taking more AP Exams at the end of the school year, more students took and retook the SAT, and academic time was saved from students missing due to extra-curricular activities. The study attributed these outcomes to less stress and ultimately resulting from implementing the block schedule. The life at school slowed down, and students were able to digest the material being taught (Flocco, 2012).

Research has indicated that block scheduling allows a safety net for failed classes where a traditional schedule does not when students fail a class. Students on the block can retake a course after the 1st Semester in a recovery setting if they failed the course. A traditional schedule is not final until the end of the school term. Therefore, summer school would have to be accessible to recover courses from a traditional schedule (Shortt & Thayer, 1998). Cannady and Rettig also reiterated the success of the block schedule by offering students summer school during the spring (Rettig & Canady, 2003). Additionally, further research indicated a positive impact on achievement related to the school schedule. A North Carolina Study by Zhang (2003) examined the two schedules, block and traditional and the impact it had on student achievement. The state of North Carolina quickly transitioned to block scheduling going from six schools in the early 90's to over 280 in early 2000. The study took the approach of measuring state assessment scores in highs schools across the state and comparing student achievement in those schools. The report went on to indicate that the 4x4 block schedule had a significant positive impact on student achievement in the areas of Algebra I, Economics, and Political Science. However, no positive impact in the areas of US History and Biology was found.

Further studies from Laitsh (2004) took a look at high schools in Florida. Out of 10 high school studied, 5 were on block and 5 were on a traditional, seven period schedule. The study examined student suspension and attendance. Students need to be in school on a regular basis so that the child can be educated. The studies concluded that there were not any significant differences found in the areas of suspension and attendance. Although the test data indicated no significant difference, school leaders felt like students were in class sooner, paid more attention, and there were less out of class disruptions on the block schedule.

Another study conducted in Mississippi in 2009 (Smith, 2009) examined nearly 70 schools, with half being on block and the other half being on a traditional class schedule. This study found significantly higher achievement scores in the areas of biology, US History and high school English on state assessments operating on a block schedule. There were also not significant differences found in the areas of writing, specifically in the area of English. In essence, this study showed a higher percentage of pass rates in Algebra, Biology, and English, but not in US History and Writing (Smith, 2009). One other study important to this research topic took place in North Carolina comparing Algebra and Biology covering a two year span from 2001 – 2003, as one school term students were on a block schedule and the following year, students were on a traditional schedule. The study did not find a significant difference in the schedule the students were on (Ellis III, 2004). In summary, the research conducted has presented mix reviews on what which schedule works better, block or traditional in terms of scheduling the time frame of classes for students in schools (Williams, Jr., 2011).

Extra-curricular activities have also been impacted based on the schedule the student attended school in. Dunigan and Hoover (2007), studied 12 schools, 6 on block scheduling and 6 on a traditional schedule to determine the involvement in Future Farmers of American intra-curricular organization. This study examined over 288 FFA members to see if leadership attainment was affected by the schedule the student studied under. Each group used meeting attendance, conference attendance, degree accomplishments, and contest entries. The results of the study concluded there were few statistical differences in member involvement and the schedule the student studied under (Dunigan & Hoover, 2007).

Additional Advantages of Block Scheduling

There was a relationship between class time and the learning process for students. Each student is different in that some students need a shorter period of time to learn the material as other students require longer lengths of time at one setting to gain an understanding of the content (Gallager, 2009). Class time that is longer so that relationships can be built among teachers and students have been an advantage to block scheduling as well in that that teachers and faculty members have acknowledged as important and beneficial to the learning process (The Core Academic Learning Time Group, 2002). Studies conducted in 2006 along with research by Stronge (2007) have clearly indicated in his study that time in class can directly impact instruction in a positive manner. Block scheduling allowed for teachers to facilitate the learning environment so that there was time for teachers to vary instructional strategies as well as keen in on the different learning styles of all students (Dunham, 2009). Ultimately, school administrators and board level staff were striving to support students toward a timely graduation and with a meaningful diploma. In the Banville and Rickard study (2005), there were positive results from the physical education department. Having the ability to conduct multiple activities throughout the longer period of time in PE allowed for students to be involved in stretching, skill development, and games in one class period. The researcher indicated teachers were able to spend time on the curriculum and teach more in-depth standards within the class period. In addition, there was more time for students to complete exercises at a higher repetition level. Additional benefits have also been reported by Kelcher, (2003). Research conducted by Kelchner (2003) reported that block scheduling allows teachers to focus on specific task, with fewer lectures, having fewer discipline problems, therefore increasing the graduation rate. From an instructional standpoint, school personnel indicate students perform better while only having 4 classes per semester, versus six or seven classes at a time. Students can focus on a few number of classes at a time, therefore achievement should improve and be positive for the student and school (Queen, 2002). Meaningful instruction offered at longer periods of time can lead to fewer discipline problems. . Along those same lines, less class changes result in few opportunities for students to engage in out of class disruptions that lead to time out of class due to discipline protocols (Dunham, 2009). Additionally, there are many ways students, schools, and teachers benefit from block scheduling. Following are some benefits of block scheduling suggested by Dunham (2009):

- Class changes for students are limited
- Longer periods of class time allow for deeper instruction
- Teachers have the opportunity to vary their teaching styles based on student need
- Teachers and students have less courses to prepare for each day
- The number of students each teacher has each day is lower
- Planning time for teachers is increased to 90 minutes
- Teachers and students have the opportunity to build better relationships
- Students are given opportunities to work on projects
- Teachers have more time to work with students one on one in class.

In Summary, there were many advantages to block scheduling, but did block scheduling really have that much of a direct impact positively on student achievement? There are arguments that would state, student achievement and the success of the student is directly related to what the teacher does with his or her time with the students, instead of how the school day or class schedule is established (Bottge & Gugerty, 2004).

The mixed reviews continue as one study conducted in 23 block and 20 traditional schools in Virginia found that students in the area of math and reading did not show a significant differences in their scores. Wallicia (2011), went on to show black and Hispanic students did perform better on the block schedule than their counterparts educated on the traditional schedule. A larger percentage of black and Hispanic students performed higher when comparing passing and advanced passing scores within the block model (Wallicia, 2011).

Disadvantages of Block Scheduling

Block scheduling has been around for quite some time now. Schools made drastic changes to their schedules in the 1980’s in an effort to increase student achievement. As literature is reviewed, it was important to not only communicate the benefits of block scheduling, but also the down falls of block scheduling from an instructional standpoint. Queen (2008) made a point within his handbook on implementing the block schedule that teachers not properly trained to teach on the block may very well continue to teach in a way they were accustomed to, this includes standard lecturing to cover the material for state mandated exams. Teachers that continued to lecture and not provide small increments of time for students to engage in different learning activities based on the students learning style and the task for the class may use the extended time students have for homework (Queen, 2008). This may have led to perceived beliefs that block scheduling is good and provides additional time for students to work, when in reality the work may not be meaningful (Kenny, 2003).

Modified Block Scheduling

Mixing the block and traditional schedules was sometimes the option schools choose to undertake when neither schedules on their own fit the needs of the students and teachers. Modified block scheduling also came on the scene in the 1990s as a way to try some type of block schedule before going to full block. This composite schedule allowed schools to keep some of the traditional schedule values in place while blocking some classes to meet the needs of certain students. In 1999 the Watauga County School District began to look at other alternative scheduling methods to fit the needs of their students. The district believed a combined schedule could work. Some courses were blocked while others remained on a traditional schedule. The district chose a team approach to scheduling to establish a better understanding; therefore, more horizontal and vertical planning took place. The district had success in mixing the block due to the comprehensive planning among team members as they determined which courses would be taught under a block segment and which courses would be taught under the traditional setting. The district wanted to verify students were not just placed in courses to make the mixed scheduling approach work. Therefore, the schedule could be modified to meet the needs of the school (Childers & Ireland, 2005).

Another study was conducted at South Springfield High School in the Midwest that took the approach of a tri-schedule. One group of students was assigned to a 4 x 4 block, one group was assigned to a traditional schedule, and the final group was assigned to a combination of a block and traditional type schedule. The teachers and administrators reported the methods of teachers changed while operating under the block and hybrid schedules. Students reported the method of instruction changed slightly under the traditional model. The variety of instruction was the most reported asset to the block and hybrid models from faculty, staff, and students. Math teachers used more time to examine problems while English teachers had time to re-teach material not understood. The study concluded that the hybrid model was most effective for students, but the students on the block demonstrated better grades, a more positive attitude about school, attended school on a regular basis, and had higher overall grade point averages. The study goes on to elaborate on some obstacles associated with block scheduling. Teachers at South Springfield High School were not unanimous in approving block schedules as the best fit for their school. Some explained the time in class was too crucial and the content had to be packed into one semester. Ninety minutes was a long time to ask students to be engaged in one subject. Teachers reported less time to reflect with little time to re-teach on the block schedule. Relationships with students suffered as well because of the teaching pace that had to be maintained on the block (Veal & Flinders, 2001).

Traditional Scheduling

As mentioned earlier, the traditional schedule has been around for a long time, dating back to the industrial age. Teachers were expected to use a base set of minutes and cover material adequately in that specific amount of time. In the end, credits were awarded when a passing grade was produced. The traditional schedule allowed for students to learn one class at a time for a specific amount of time and then move on to another subject and maybe even a different teacher. This was the standard way of learning for most high schools in the earlier years of educating students (Kruse & Kruse, 1995).

Advantages of Traditional Scheduling

As with the block schedule in high schools, there were some advantages for some students and the school in general while operating on a more traditional schedule. The 7-period day is a traditional schedule used by many schools throughout the U.S. Schools operating on a 7-period day engage students in 9000 minutes of instruction while schools on the block have the opportunity to engage students in only 8100 minutes of instruction. Some examples include, students having the opportunity to meet with their teacher everyday in smaller increments of time may be better than meeting for a longer period of time. Students that have ADHD or other specific disabilities that hinder the student from paying attention for a 90-minute block tend to have an easier time paying attention in a 50-minute more traditional class period (Cromwell, 2006). Cromwell (2006), goes on to state that the traditional schedule allows for students the opportunity to gain valuable experience in the area of time management, balancing schedules, moving from class to class, which in some ways prepares them for life after high school. Attendance is another issue that is important in school and the traditional schedule is student friendly in that less work is missed when a student is absent on the traditional schedule versus a missed class in a 90-minute block scheduled term.

Summary

The goal and mission of school districts across the nation are to educate students to become productive citizens. That mind set has been around for many years. No matter which schedule was available for students, instruction in the classroom may not change. The teacher may teach as he or she has been trained or accustomed to. In essence, school districts that implement longer class periods at any level may have the opportunity to offer more students centered or project based assignments, but the teacher uses the extra time for the student to complete homework or an additional study hall time, there is not a true benefit of being on a block schedule (Intervention Central, 2013). When this occurs, students become more laid back or passive towards instruction and sometimes the content substance may dwindle. What has changed over the years is the access and the resources used to produce quality citizens and students for our country. School administrators are seeking qualified teachers to help districts meet the goals of the school in a global society that is ever changing with technology and expectations from the work place. The schedule within schools is important, but not as important as the work done by teachers and staff members through professional development and faculty training (George, 1997). Schools that operate effectively and efficiently fulfill the obligation of education students no matter the schedule during the 8-hour school day. Race, gender, socioeconomic status or disability does not matter when educating the students of the future, only the focus on the student. Accountability is well known and is becoming more and more strenuous school administrators have felt the pressure from the government and have tweaked schedules to help raise student achievement. The perception of change has been a common denominator among school districts over the past 50 years. The school instructional leader has also been an integral part along with the principal while dealing with the schedule changes.

Educators have changes schedules for decades to accommodate the request of the US Department of Education with the accountability standards put forth. This literature review indicates the structuring of classroom time may have an effect on different parts of the school day. The mystery lies in the assessment portion of student achievement. Educators have discovered that the daily schedule can help schools.

Schools have viewed schedule changes as a vehicle to make schools better. Block scheduling and modified-block scheduling has been the catalyst for change over the past 50 years. Some schools have moved from a traditional schedule to a block schedule or modified block schedule using the classroom in a different manner to educate students. School officials have been seeking ways to use time more wisely and perform better (Kenney, 2003).

School leaders must ask the question, how effective is the current operating schedule and what changes can be made to benefit our students academically? How effective is block scheduling or another alternative schedule compared to a more traditional schedule? After an extensive review of the literature from past and present, there is a perceived perception that the block schedule is more beneficial to students, faculty, and staff. The literature clearly outlines the benefits for teachers in the way of extended planning time, fewer students, opportunities to create project based activities, increased grade point averages, less homework, and fewer discipline problems. The lists of benefits are not directly related to the impact it may have on student achievement (Canady & Rettig, 1997; Kruse & Kruse, 1995; Hurley, 1997; & Skrobarcek & Others, 1997).

Throughout this literature review, there were some perceived disadvantages to the block schedule as well. The literature indicated that there is no clear significant difference in the achievement of students on standardized test. Grade point averages in many studies were inflated after a period of time, but there was no evidence of higher grades on end of course(s) assessments. Teachers indicated the block schedule allowed for better use of instructional time, but evidence indicated through the research, teachers still used a traditional approach to teaching and allowed more time for homework. There is also less instructional class time on a block schedule of 8100 minutes compared to 9000 minutes on a traditional 50-minute schedule. Another key disadvantage to the block is the missed class time rule. Students missing one block class results in missing two days of a traditional schedule. The time for students to catch up on the block doubles when students are out of school for various reasons. Finally, there was a gap in the training needed for teachers on the block compared to teaching on a traditional schedule (Slate & Craig, 2000).

The research demonstrated a gap in the number of studies available testing student achievement success on a traditional class schedule. The literature clearly indicated evidence of teacher and staff advantages on the block. School staff members indicated they like the block because of the amount of planning time available and fewer classes to prepare for at one time. The gap is demonstrated in the area of student achievement and the lack of evidence the block is better. In this study, the researcher will examine student achievement levels on a traditional schedule compared to student achievement levels on a block schedule.

CHAPTER 3

METHOD

The researcher has indicated there was a need to examine if the schedule implemented has impacted the results of the EOCT in a positive or negative manner based on the two schedules. Both high schools transitioned from 4 x 4 Block to a seven-period schedule beginning with the 2012-2013 school year. Each high school operated on the block schedule for fifteen years prior to moving to a traditional seven-period school day.

The purpose of this research was to examine the two high schools in rural South Georgia and how the different scheduling models evoked an array of views related to the achievement levels on the five Georgia End-of-Course Exams and the Georgia High School Graduation Writing Test.

It was imperative that school administrators find out which instructional schedule works more effectively in terms of student achievement in the areas of Math, English, Writing, Science, and Social Studies as evidenced on the five End-of-Course Exams. The researcher compared student achievement using the type of schedule as the independent variable. Thus, the following research question guided the investigation:

1. Which type of scheduling model – the block schedule or the traditional schedule result in higher student scores on the Georgia End-of Course examinations and the Georgia High School Graduation writing test?
2. Was there a differential benefit in terms of higher EOCT/GHSWT scores during block or traditional scheduling when considering student gender, race, or SES?

Design of the Study

The purpose of this study was to examine two high schools in rural South Georgia and examine which type of scheduling model – the block schedule or the traditional schedule-result in higher student scores on the Georgia End-of Course examinations and the Georgia High School writing test? This quantitative investigation determined how effective a traditional schedule was versus a block schedule on the five EOCT's as well as the GHSGWT. This research was conducted in two South Georgia schools and was ex post facto in nature. No experimentation occurred as the study relied on historical data. The researcher examined both high schools individually; comparing the five EOCT's and the Georgia High School Writing Test under the block schedule during the 2011-2012 school with the same exams under the 7-period traditional schedule during the 2012-2013 and 2013-2014 school terms. Each school was compared to itself due to the different dynamics of each school. The following Figures represent a visual of the two schedules; block and traditional 7-period day:

Figure 1: School 1

Figure 1 represented a comparison of students at School 1 from block scheduling during the 2011-2012 school term to students at School 1 from the 7-period scheduling model during the 2012-2013 and 2013-2014 school terms in the areas of 9th Grade English, 11th Grade English, 9th Grade Biology, 10th Grade Physical Science, 11th Grade US History, and the 11th Grade Georgia High School Writing Test. The model below shows each of the predictors that were measured (scheduling type, sex, race, SES, classification, and school year) along with the various dependent variables.

Figure 1: School 1

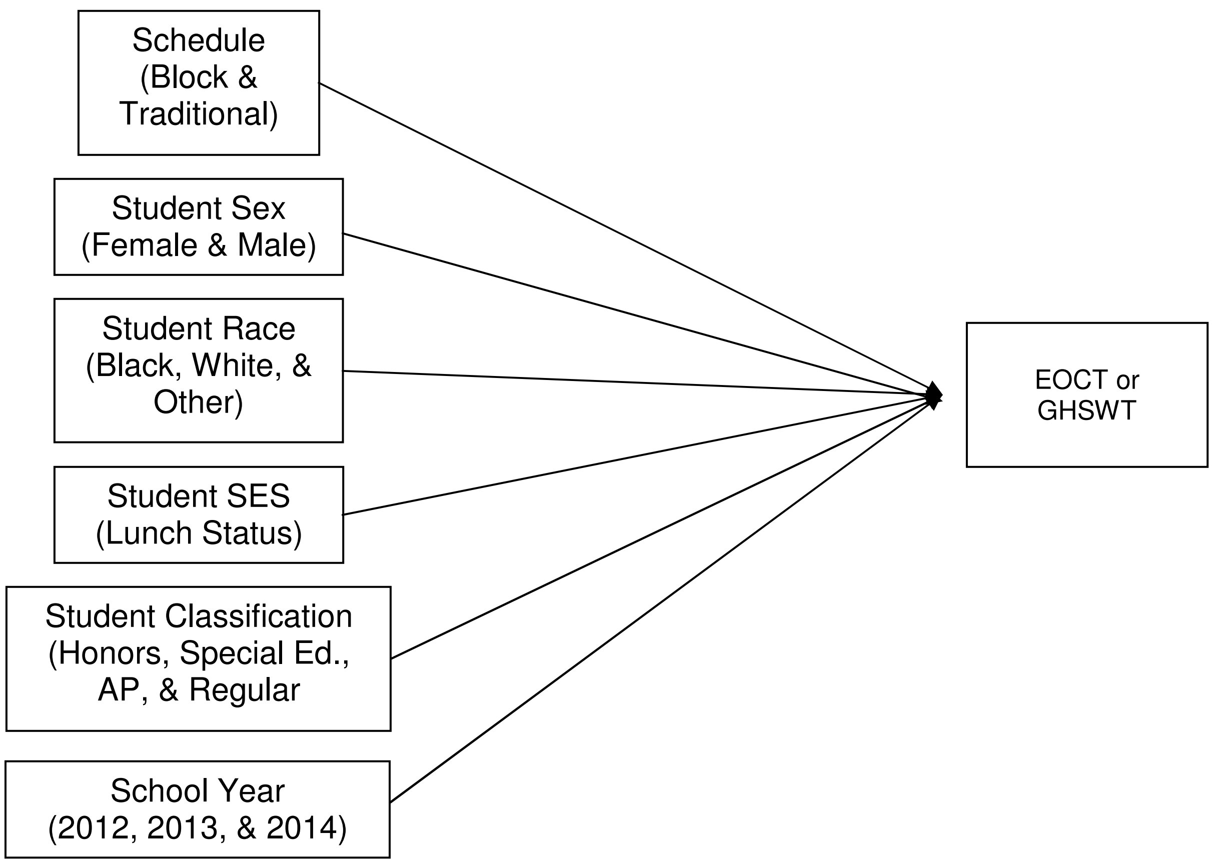
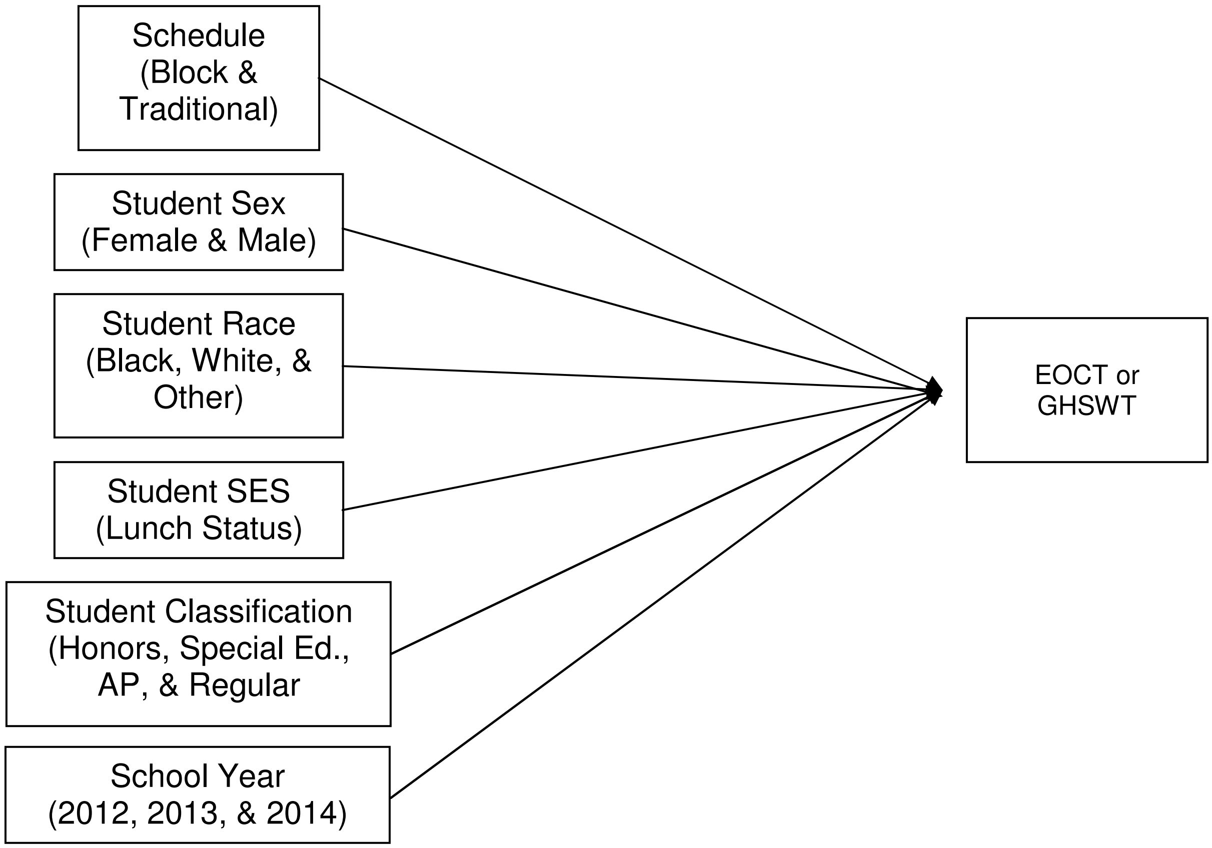


Figure 2: School 2



The design was a 2-group design, where within group EOCT and Georgia Writing test comparisons were made between block and seven-period day scheduling formats. Each school was very different in terms of student demographics; therefore the examination within each school was imperative rather than an examination between the two schools. In other words, each school was compared under two different scheduling formats. The study was quantitative in nature. The researcher chose to conduct a quantitative study so that the data provided was concrete evidence to which schedule students performed best on from a standardized assessment view. In addition, the researcher examined the data from the five EOCT's and the Georgia High School Writing Test using descriptive statistics, including means and standard deviations. A multi-way

ANOVAs with 6 factors (schedule, sex, race, SES, classification, and school year) was used to determine if a significant difference existed between the students instructed on a 4 x 4 block schedule and students instructed on a seven-period day traditional scheduled. The multi-way ANOVAs allowed for testing of interactions among predictors. The interactions helped show if any specific sub-groups benefited more operating within one scheduling model than another. The data being analyzed in this study was measured from the 2011-2012 block scheduling school year and the 2012-2013 and 2013-2014 traditional seven period day school year. An independent t-test was used to test for differences in the means of the dependent variable broken down by the levels of the independent variable.

Population

The research setting was two high schools from the same county in rural South Georgia, where the research took place. The demographics of the schools reflected two distinctly different socio-economic profiles. School 1 had a population consisting of 1805 students, of which 75% White, 24% Black, and 1 % other. School 2 had a population consisting of 1456 students, of which 88% White, 9 % Black, and 2% other. Both high schools have populations that were from high, middle, and low socioeconomic backgrounds. School 1 had 36% of its students that were low socioeconomic and School 2 only had 20% of its students that were low socioeconomic. Both high schools received populations from three middle schools consisting of similar types of populations found at the high schools.

Participants

The research participants for this study consisted of students from grade levels 9-12. Each of the following grade levels had courses that had a Georgia State EOCT at the end of the course. Students in grade nine were enrolled in Biology and 9th Grade English. Students in grade ten were enrolled in Physical Science. Students in grade 11 were enrolled in U.S. History, 11th Grade English, and the Georgia Writing Test. Finally, students in 12th grade were enrolled in Economics. The student population for each grade level was approximately 425 students for each EOCT exam.

Data Collection

The researcher gained information for this study through EOCT scores from the eight required state end of course exams administered by staff members at the high school setting. The EOCT courses were mandated by the Georgia Department of Education and were an integral part of the College and Career Ready Performance Index (CCRPI). The researcher gained permission from the Assistant Superintendent in charge of Curriculum and Technology for the school system in order to use the EOCT scores for students who took 9th Grade Literature, 11th Grade Literature, 9th Grade Biology, 10th Grade Physical Science, and 11th Grade U.S. History from 2011-2012, 2012-2013 and 2013-2014. In addition, the researcher gained permission to use the Georgia High School Writing Test (GHSWT) scores for students from 2011-2012, 2012-2013 and 2013-2014 school years.

Also, the researcher gained approval from the Institutional Review Board (IRB) from Georgia Southern University. The researcher gained access to the EOCT and

GHSWT score information from the System Testing Coordinator for the school system as well as downloadable data from the systems information database.

The researcher gained access of records from the database in Infinite Campus, the county's scheduling computer information system and export data into a Microsoft Excel file. The results from each exam were recorded by the State of Georgia and were downloaded into Infinite Campus Information System. Access of the scores was gained by teacher and subject area for both school terms as well as both high schools. Scores from the 2011-2012 school year reflected EOCT and GHSWT scores on the 4x4 block schedule. EOCT and GHSWT scores from the 2012-2013 and 2013-2014 school years reflected scores on the traditional seven-period yearlong schedule. Students were identified by numbers and all information pertaining to identify an individual student, teacher, or school were removed to ensure the anonymity and confidentiality of all subjects involved.

Data Analysis

The researcher examined students' scores from all levels within each school. The data from the 2011-2012 block schedule was compared to the 2012-2013 and 2013-2014 traditional seven period day schedule by statistically comparing the two groups using One-Way ANOVA calculations, to determine whether a significant difference existed between the five EOCT and GHSWT scores of those on a traditional schedule versus those on a block schedule. The t-test assesses whether the means of two groups are *statistically* different from each other. In essence, the researcher analyzed whether the EOCT's and Writing Test scores are statistically different based on the schedule the students were administered the exams.

Assumptions of the Study

The following assumptions underscored this research study. First, quantitative research was used to examine the relationship among variables. The assumption that bias was protected and the researcher was able to generalize and replicate the findings (Creswell, 2009). Second, the researcher used exam scores from two rural high schools in South Georgia in which the researcher has great familiarity.

Delimitations

The study was delimited to Georgia public high schools because of my familiarity with this level of school and design of testing and assessment in Georgia public schools.

Limitations

The researcher did expect certain limitations that were beyond the control of the researcher. Included as a limitation of this study were students that transfer into either of the two high schools from outside the county, state, or country. There was some students who withdrew or enrolled throughout the school term. In addition, not all students were on track to graduate on time. Therefore, some students who needed the courses via credit recovery was not be included in the study.

Instructional focus is the most important aspect of schools and the schedule in which schools operate under become the vehicle or plan to help educators reach those goals. A clear school schedule enables staff members to plan with focus and goals supported by instruction and resources.

In conclusion, each school system must choose a schedule that fits their community, school, and population. The researcher indicated that school schedules will never be perfect, but the Department of Education has charged school districts to compare test scores to measure student achievement. Both schedules; 4 x 4 block and seven-period traditional were used in this study, and may continue to be used to help schools make sound decisions concerning the school schedule and it relation to student achievement its role as school progress towards to a high level Career and College Performance Index.

CHAPTER 4

RESULTS

Chapter 4 presents the results obtained from this study. The chapter begins with a review of the research questions and the research design along with the methods of data analysis. The hypotheses associated with the research questions are evaluated and summarized within this chapter. Finally, an overall summary of the findings from this study is provided.

Purpose of the Study

The purpose of this study was to examine how schools utiliz3e block scheduling and traditional scheduling models differ in achievement levels on the five Georgia End-of-Course Exams (EOCT) and the Georgia High School Graduation Writing test (GHSWT) at two high schools in rural South Georgia. The researcher also investigated if there was a differential benefit in terms of higher EOCT/GHSWT scores during block or traditional scheduling when considering demographic variables student gender, race, or SES. No experimentation was used as the study relied on historical data. Both high schools were examined individually; comparing the five EOCT's and the GHSWT under the block schedule during the 2011-2012 school with the same exams under the 7-period traditional schedule during the 2012-2013 and 2013-2014 school terms. The design comparison for this quasi-experimental study was a two-group non-random selection design comparing each school to itself rather to each other.

Research Questions

There were two central questions of this study. Administrators needed to know from an achievement standpoint, which instructional schedule works more effectively in the areas of English, Writing, Science, and Social Studies as evidenced on the five Georgia

End-of-Course Exams. The type of schedule will serve as the independent variable in this study. Thus, the following research questions will guide the investigation:

1. Was there a difference in academic achievement as measured by the five Georgia End-Of-Course Exams and the Georgia High School writing test based on scheduling format, block schedule or traditional schedule?
2. Was there a difference in academic achievement as measured by the five Georgia End-Of-Course Exams and the Georgia High School writing test based on scheduling format, block schedule or traditional schedule in the areas of race, gender, SES, Gifted students, and Students with Disabilities status?

Research Design

The design was a 2-group design, where within group EOCT and Georgia Writing test comparisons were made between block and seven-period day scheduling formats. Each school was very different in terms of student demographics; therefore the examination within each school was imperative rather than an examination between the two schools. In other words, each school was compared under two different scheduling formats. The study was quantitative in nature. The researcher chose to conduct a quantitative study so that the data provided will be concrete evidence to which schedule students performed best on from a standardized assessment view. In addition, the researcher examined the data from the five EOCT's and the Georgia High School Writing Test using descriptive statistics, including means and standard deviations.

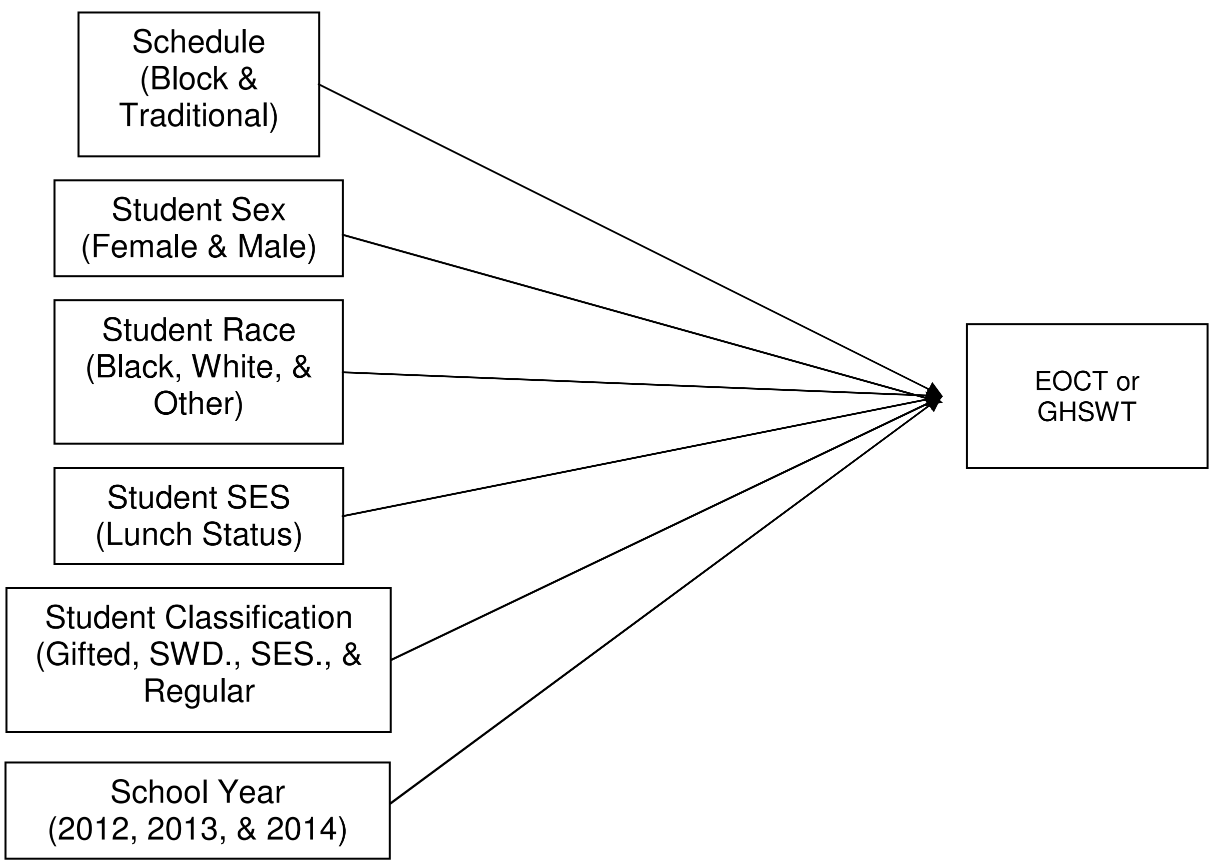
A multi-way ANOVAs with factors (schedule, sex, race, SES, SWD, gifted, and school year) was used to determine if a significant difference existed between the students instructed on a 4 x 4 block schedule and students instructed on a seven-period day traditional scheduled. The multi-way ANOVAs allowed for testing of interactions among predictors. The interactions helped show if any specific sub-groups benefited more operating within one scheduling model than another. The data being analyzed in this study measured from the 2011-2012 block scheduling school year and the 2012-2013 and 2013-2014 traditional seven period day school year. An independent t-test was used to test for differences in the means of the dependent variable broken down by the levels of the independent variable.

The achievement data was obtained from the school systems information systems department and from the Georgia Department of Education. The raw data indicated the achievement scores for School 1 and School 2 on the five Georgia End-Of-Course Exams in the areas of ninth grade English, eleventh grade English, Biology, Physical Science, US History, and the Georgia High School writing test. The data was disaggregated into subgroups including race, sex, socioeconomic status, and students with disabilities. The above test data included scores from the 2011-2012 school term on block scheduling and 2012-2013 and 2013-2014 school term on the seven period traditional schedules. The demographic information from School 1 and School 2 was also obtained from the school systems Information Systems department. The following figure illustrates the use of the data in this study.

Figure 1: School 1 and 2

Figure 1 represents a comparison of students at School 1 and School 2 from block scheduling during the 2011-2012 school term to students at School 1 and School 2 from the 7-period scheduling model during the 2012-2013 and 2013-2014 school terms in the areas of 9th Grade English, 11th Grade English, 9th Grade Biology, 10th Grade Physical Science, 11th Grade US History, and the 11th Grade Georgia High School Writing Test. The model below shows each of the predictors that will be measured (scheduling type, sex, race, SES, classification, and school year) along with the various dependent variables.

Figure 1: School 1 and 2



Findings

The findings section of this chapter was presented in several sections that reflect the analysis of data pertaining to the research questions. The sections discussed the findings of the statistical analysis reported for achievement scores in the areas of ninth grade English, eleventh grade English, Physical Science, Biology, US History, and the Georgia High School writing test from the 2011-2012 block schedules from School 1 and School 2 as well as statistical analysis reported from the 2012-2013 and 2013-2014 traditional schedules from School 1 and School 2. Each subject areas scores were disaggregated for male, female, white, black, free and reduced meal, full pay meal students, special education students, and non-special education students. Each group's data were then analyzed for differences between 4 x 4 block scheduled students and seven-period traditional, year-long scheduled students for statistical differences.

Statistical Analysis Procedures

A multi-way ANOVA with factors (schedule, sex, race, SES, SWD, gifted and school year) was used to determine if a significant difference existed between the students instructed on a 4 x 4 block schedule and students instructed on a seven-period day traditional schedule. The multi-way ANOVAs allowed for testing of interactions among predictors. The interactions helped show if any specific sub-groups benefited more under one scheduling model than another.

Analysis – School 1

For each of the two schools studied in this paper, three tables were presented for each subject area; Writing, Physical Science, 9th Grade English, Biology, US History, and 11th Grade English. The first table included the mean score and total number of students for each school by school year and demographic information including, race, gifted status, gender, SWD status, and SES status. The second table provided a summary of the ANOVA results of significant differences among demographic predictors. The third table for each subject area studied provided comparisons of mean differences by subject area for school year and race. Each set of tables are grouped by subject area for School 1 (1-3, 4-6, 7-9, 10-12, 13-15, and 16-18).

Table 1
Writing Test Scale Score Descriptive Statistics by School Year and Other Factors for School 1

	Observed Mean	Adjusted Mean	SD	n
School Year				
2011-2012 (Block)	215.48	208.83	27.05	508
2012-2013 (Trad.)	218.42	219.46	25.54	472
2013-2014 (Trad.)	213.57	206.02	26.65	504
Race				
Black	204.74	206.43	25.85	365
White	219.73	215.11	24.63	988
Other	216.65	212.77	32.71	131
Gifted				
Yes	241.46	221.56	22.63	157
No	212.73	201.31	25.25	1327
Econ. Disad.				
Yes	207.44	208.58	28.10	625
No	221.83	214.29	23.49	859
SWD				
Yes	185.64	196.30	37.20	215
No	220.87	226.57	20.19	1269
Sex				
Female	220.25	214.48	24.93	717
Male	211.58	208.39	27.24	767

Table 2

ANOVA Summary for Writing Test Scale Score by School Year and Other Factors for School 1

Source	SS	df	MS	F
School Year	9393.46	2	4696.73	10.30*
Race	17226.90	2	8613.45	18.89*
Gifted	53321.24	1	53321.24	116.93*
Econ. Disad.	9828.18	1	9828.18	21.55*
SWD	157553.10	1	157553.10	345.49*
Sex	13416.43	1	13416.43	29.42*
School Year * Race	2201.03	4	550.26	1.21
School Year * Gifted	2860.06	2	1430.03	3.14
School Year * Econ. Disad.	510.48	2	255.24	0.56
School Year * SWD	1934.71	2	967.36	2.12
School Year * Sex	564.49	2	282.24	0.62
Error	667171.40	1463	456.03	

Note: $R^2 = .36$, adj. $R^2 = .35$.

* p < .01

Table 3

Comparisons of Mean Differences in Writing Test Scale Scores by School Year and Race for School 1

Comparison	Estimated Mean Difference	Standard Error of Difference	Bonferroni Adjusted 99% CI
School Year			
11-12 vs. 12-13	-10.64*	3.16	-19.92, -1.35
11-12 vs. 13-14	2.81	3.10	-6.32, 11.94
12-13 vs. 13-14	13.45*	3.10	4.32, 22.58
Race			
Black vs. White	-8.68*	1.41	-12.83, -4.53
Black vs. Other	-6.35*	2.21	-12.84, .150
White vs. Other	2.34	2.02	-3.60, 8.27

* p < .01, where p-values are adjusted using the Bonferroni method.

ANOVA results, presented in Table 2, showed that there were statistically significant mean differences in Writing Test scores by School Year, Race, Gifted status, Economic Disadvantage status, SWD status, and student Sex. As Table 1 shows, gifted students scored higher, those without an economic disadvantage scored higher, those without a disability scored higher, and females scored higher. Table 3 shows multiple comparisons for School Year and Race. On average scores for the 2012-2013 year was highest with a mean average of 218.42 and a standard deviation of 25.54, and the years 2011-2012 and 2013-2014 produced similar mean levels of achievement with mean scores of 215.48 and 213.57. Table 3 results also showed that the score for Black students was lower (mean of 204.74 & SD of 25.85) than for White (mean of 219.73 & SD of 24.63) or Other students (mean of 216.65 & SD of 32.71). There was little difference in mean scores between White and Other students. Interactions between School Year and the other factors were tested in the ANOVA model to learn whether differential performance occurred across the three years examined. Since none of the interactions were statistically significant at the .01 level, there was little statistical evidence that the pattern of mean differences found in one year varied from the other school years. For example, the lack of an interaction between School Year and Race suggests that the relative performance of students by race was similar for each of the three years examined.

Table 4

Physical Science Test Scale Score Descriptive Statistics by School Year and Other Factors for School 1

	Observed Mean	Adjusted Mean	SD	n
School Year				
2011-2012 (Block)	451.74	459.93	58.08	476
2012-2013 (Trad.)	463.08	470.14	53.38	433
2013-2014 (Trad.)	465.56	472.75	57.80	491
Race				
Black	432.19	452.89	48.73	313
White	467.78	472.82	55.57	974
Other	471.10	477.11	64.24	113
Gifted				
Yes	536.75	504.97	48.04	166
No	449.78	430.24	49.61	1234
Econ. Disad.				
Yes	441.74	460.75	53.18	575
No	472.88	474.46	55.85	825
SWD				
Yes	409.02	444.25	42.76	134
No	465.50	490.97	55.47	1266
Sex				
Female	454.71	460.16	51.98	708
Male	465.60	475.06	60.99	692

Table 5

ANOVA Summary for Physical Science Test Scale Score by School Year and Other Factors for School 1

Source	SS	df	MS	F
School Year	7141.18	2	3570.59	1.77
Race	87568.88	2	43784.44	21.68*
Gifted	769238.39	1	769238.39	380.94*
Econ. Disad.	52042.26	1	52042.26	25.77*
SWD	249088.02	1	249088.02	123.35*
Sex	75546.13	1	75546.13	37.41*
School Year * Race	20657.31	4	5164.33	2.56
School Year * Gifted	2104.05	2	1052.02	.52
School Year * Econ. Disad.	13883.78	2	6941.89	3.44
School Year * SWD	494.61	2	247.31	.12
School Year * Sex	561.18	2	280.59	.14
Error	2784605.85	1379	2019.29	

Note: $R^2 = .38$, adj. $R^2 = .38$.

* $p < .01$

Table 6

Comparisons of Mean Differences in Physical Science Test Scale Scores by School Year and Race for School 1

Comparison by Instructor	Estimated Mean Difference	Standard Error of Difference	Bonferroni Adjusted 99% CI
School Year			
11-12 vs. 12-13	-10.21	7.38	-27.90, 7.48
11-12 vs. 13-14	-12.82	7.21	-30.09, 4.45
12-13 vs. 13-14	-2.61	7.46	-20.49, 15.27
Race			
Black vs. White	-19.93*	3.22	-27.64, -12.22
Black vs. Other	-24.23*	5.02	-36.25, -12.20
White vs. Other	-4.30	4.55	-15.189, 6.60

* $p < .01$, where p-values are adjusted using the Bonferroni method.

ANOVA results, presented in Table 5, show that there were statistically significant mean differences in Physical Science scores by Race, Gifted status, Economic Disadvantage status, SWD status, and student Sex. As Table 4 shows, Gifted students scored higher, those without an economic disadvantage scored higher, those without a disability scored higher, and males scored higher. Table 6 showed multiple comparisons for School Year and Race. On average scores for the 2013-2014 (traditional) year was highest with a mean score of 465.56 and a standard deviation of 57.80, and the year 2011-2012 (block) having a mean of 451.74 and a standard deviation of 58.08 was the lowest mean level of achievement. Table 6 results also showed that the score for Black (mean of 432.19 & SD of 48.73) students was lower than for White (mean of 467.78 & SD of 55.57) or Other (mean of 471.10 and SD of 64.24) students. There was little difference in mean scores between White and Other students. Interactions between School Year and the other factors were tested in the ANOVA model to learn whether differential performance occurred across the three years examined. Since none of the interactions were statistically significant at the .01 level, there was little statistical evidence that the pattern of mean differences found in one year varied from the other school years.

Table 7
U.S. History Test Scale Score Descriptive Statistics by School Year and Other Factors for School 1

	Observed Mean	Adjusted Mean	SD	n
School Year				
2011-2012 (Block)	435.24	433.85	45.08	322
2012-2013 (Trad.)	434.63	438.49	57.11	320
2013-2014 (Trad.)	446.17	446.09	56.31	308
Race				
Black	415.83	424.38	48.80	326
White	443.81	441.70	53.51	308
Other	453.33	452.34	45.34	364
Gifted				
Yes	490.99	463.84	45.77	397
No	431.29	415.11	53.26	308
Econ. Disad.				
Yes	422.31	433.60	49.26	477
No	448.94	445.35	53.14	757
SWD				
Yes	393.25	418.81	44.24	107
No	442.96	460.14	52.04	1127
Sex				
Female	432.35	431.72	49.50	633
Male	445.28	447.23	56.24	601

Table 8

ANOVA Summary for U.S. History Test Scale Score by School Year and Other Factors for School 1

Source	SS	df	MS	F
School Year	4863.70	2	2431.85	1.15
Race	73207.52	2	36603.76	17.25*
Gifted	293460.70	1	293460.70	138.28*
Econ. Disad.	33633.56	1	33633.56	15.85*
SWD	157966.07	1	157966.07	74.43*
Sex	72531.79	1	72531.79	34.18*
School Year * Race	9900.88	4	2475.22	1.17
School Year * Gifted	13230.78	2	6615.39	3.12
School Year * Econ. Disad.	251.27	2	125.64	.06
School Year * SWD	2398.86	2	1199.43	.57
School Year * Sex	1663.85	2	831.92	.39
Error	2574333.32	1213	2122.29	

Note: $R^2 = .26$, adj. $R^2 = .25$.
* $p < .01$

Table 9

Comparisons of Mean Differences in U.S. History Test Scale Scores by School Year and Race for School 1

Comparison	Estimated Mean Difference	Standard Error of Difference	Bonferroni Adjusted 99% CI
School Year			
11-12 vs. 12-13	-4.64	8.23	-28.83, 19.56
11-12 vs. 13-14	-12.24	8.20	-36.34, 11.86
12-13 vs. 13-14	-7.60	8.05	-31.28, 16.08
Race			
Black vs. White	-17.32*	3.49	-27.59, -7.05
Black vs. Other	-27.96*	5.44	-43.97, -11.96
White vs. Other	-10.64	4.86	-24.93, 3.64

* $p < .01$, where p-values are adjusted using the Bonferroni method.

ANOVA results, presented in Table 8, show that there were statistically significant mean differences in U.S. History scores by Race, Gifted status, Economic Disadvantage status, SWD status, and student Sex. As Table 7 shows, gifted students scored higher, those without an economic disadvantage scored higher, those without a disability scored higher, and males scored higher. Table 9 shows multiple comparisons for School Year and Race. On average scores for the 2013-2014 year was highest with a mean score of 446.17 and standard deviation of 56.31, and the year 2011-2012 with a mean score of 435.24 and a standard deviation of 45.08 was the lowest mean level of achievement. Table 9 results also showed that the score for Black (mean score of 415.83 & SD of 48.80) students was lower than for White (mean of 443.81 & SD of 53.51) or Other (mean of 453.33 & SD of 45.34) students. There was 10 point difference in mean scores between White and Other students. Interactions between School Year and the other factors were tested in the ANOVA model to learn whether differential performance occurred across the three years examined. Since none of the interactions were statistically significant at the .01 level, there was little statistical evidence that the pattern of mean differences found in one year varied from the other school years.

Table 10

9^{th} Grade English Test Scale Score Descriptive Statistics by School Year and Other Factors for School 1

	Observed Mean	Adjusted Mean	SD	n
School Year				
2011-2012 (Block)	430.80	435.79	36.11	521
2012-2013 (Trad.)	441.20	442.43	31.30	520
2013-2014 (Trad.)	446.75	441.85	34.13	522
Race				
Black	422.03	430.89	27.85	330
White	444.17	442.82	35.00	1100
Other	445.27	446.36	31.57	133
Gifted				
Yes	482.71	459.92	27.19	198
No	433.33	420.12	30.81	1365
Econ. Disad.				
Yes	428.22	435.16	32.09	668
No	448.07	444.88	33.85	895
SWD				
Yes	403.30	423.43	28.84	158
No	443.67	456.62	32.68	1405
Sex				
Female	443.53	441.94	34.47	772
Male	435.73	438.10	34.16	791

Table 11

ANOVA Summary for 9th Grade English Test Scale Score by School Year and Other Factors for School 1

Source	SS	df	MS	F
School Year	2352.29	2	1176.14	1.65
Race	35242.57	2	17621.29	24.70*
Gifted	254336.53	1	254336.53	356.44*
Econ. Disad.	30246.05	1	30246.05	42.39*
SWD	151561.98	1	151561.98	212.40*
Sex	5625.52	1	5625.52	7.88*
School Year * Race	3609.65	4	902.41	1.27
School Year * Gifted	2395.73	2	1197.86	1.68
School Year * Econ. Disad.	1405.48	2	702.74	.99
School Year * SWD	1041.70	2	520.85	.73
School Year * Sex	724.47	2	362.24	.51
Error	1100301.71	1542	713.56	

Note: $R^2 = .41$, adj. $R^2 = .40$.

* $p < .01$

Table 12

Comparisons of Mean Differences in 9th Grade English Test Scale Scores by School Year and Race for School 1

Comparison	Estimated Mean Difference	Standard Error of Difference	Bonferroni Adjusted 99% CI
School Year			
11-12 vs. 12-13	-6.64	4.15	-18.84, 5.55
11-12 vs. 13-14	-6.06	3.90	-17.52, 5.39
12-13 vs. 13-14	.577	3.98	-11.11, 12.27
Race			
Black vs. White	-11.93*	1.83	-17.31, -6.55
Black vs. Other	-15.47*	2.84	-23.831, -7.11
White vs. Other	-3.54	2.53	-10.99, 3.91

* $p < .01$, where p-values are adjusted using the Bonferroni method.

ANOVA results, presented in Table 11, showed that there were statistically significant mean differences in 9th Grade English scores by Race, Gifted status, Economic Disadvantage status, SWD status, and student Sex. As Table 10 shows, Gifted students scored higher, those without an economic disadvantage scored higher, those without a disability scored higher, and females scored higher. Table 12 showed multiple comparisons for School Year and Race. On average scores for the 2013-2014 year was highest with a mean score of 446.75 and a standard deviation of 34.13, and the year 2011-2012 with a mean score of 430.80 and a standard deviation of 36.11 was the lowest mean level of achievement. Scores for the 2012-2013 were similar to 2013-2014. Table 12 results also show that the score for Black (mean of 422.03 & SD of 27.85) students was lower than for White (mean of 444.17 & SD of 35.00) or Other (mean of 445.27 & SD of 31.57) students. There was little difference in mean scores between White and Other students. Interactions between School Year and the other factors were tested in the ANOVA model to learn whether differential performance occurred across the three years examined. Since none of the interactions were statistically significant at the .01 level, there is little statistical evidence that the pattern of mean differences found in one year varied from the other school years.

Table 13
Biology Test Scale Score Descriptive Statistics by School Year and Other Factors for School 1

	Observed Mean	Adjusted Mean	SD	N
School Year				
2011-2012 (Block)	419.80	430.22	38.47	577
2012-2013 (Trad.)	430.02	433.23	36.67	555
2013-2014 (Trad.)	445.77	439.71	39.71	444
Race				
Black	407.22	421.58	33.09	343
White	436.75	438.08	39.01	1103
Other	441.45	443.50	36.31	130
Gifted				
Yes	478.00	457.12	35.08	201
No	423.80	411.65	35.22	1375
Econ. Disad.				
Yes	418.78	430.51	36.96	667
No	439.47	438.27	39.15	909
SWD				
Yes	395.03	418.45	31.42	150
No	434.47	450.33	38.46	1426
Sex				
Female	429.22	430.27	37.74	766
Male	432.13	438.50	41.20	810

Table 14
ANOVA Summary for Biology Test Scale Score by School Year and Other Factors for School 1

Source	SS	df	MS	F
School Year	3565.64	2	1782.82	1.84
Race	67639.22	2	33819.61	34.82*
Gifted	336474.22	1	336474.22	346.44*
Econ. Disad.	19233.73	1	19233.73	19.80*
SWD	112056.32	1	112056.32	115.38*
Sex	25613.99	1	25613.99	26.37*
School Year * Race	9470.56	4	2367.64	2.44
School Year * Gifted	726.13	2	363.07	.37
School Year * Econ. Disad.	110.50	2	55.25	.06
School Year * SWD	4643.76	2	2321.88	2.39
School Year * Sex	3328.16	2	1664.08	1.71
Error	1510277.08	1555	971.24	

Note: $R^2 = .39$, adj. $R^2 = .38$.
* $p < .01$

Table 15
Comparisons of Mean Differences in Biology Test Scale Scores by School Year and Race for School 1

Comparison	Estimated Mean Difference	Standard Error of Difference	Bonferroni Adjusted 99% CI
School Year			
11-12 vs. 12-13	-3.01	4.55	-16.38, 10.36
11-12 vs. 13-14	-9.49	4.97	-24.10, 5.12
12-13 vs. 13-14	-6.48	5.12	-21.54, 8.58
Race			
Black vs. White	-16.51*	2.15	-22.83, -10.18
Black vs. Other	-21.92*	3.31	-31.66, -12.19
White vs. Other	-5.42	2.93	-14.04, 3.21

* $p < .01$, where p-values are adjusted using the Bonferroni method.

ANOVA results, presented in Table 14, showed that there were statistically significant mean differences in Biology scores by Race, Gifted status, Economic Disadvantage status, SWD status, and student Sex. As Table 4 showed, Gifted students scored higher, those without an economic disadvantage scored higher, those without a disability scored higher, and males scored higher. Table 15 showed multiple comparisons for School Year and Race. On average scores for the 2013-2014 year was highest with mean scores of 445.77 with a standard deviation of 39.71, and the year 2011-2012 with a mean score of 419.80 and a standard deviation of 38.47 was the lowest mean level of achievement. The mean score increased each year from 2011 to 2014. Table 15 results also show that the score for Black (mean of 407.22 & SD of 33.09) students was lower than for White (mean of 436.75 & SD of 39.01) or Other (mean of 441.45 & SD of 36.31) students. There was little difference in mean scores between White and Other students. Interactions between School Year and the other factors were tested in the ANOVA model to learn whether differential performance occurred across the three years examined. Since none of the interactions were statistically significant at the .01 level, there was little statistical evidence that the pattern of mean differences found in one year varied from the other school years.

Table 16
11th Grade English Test Scale Score Descriptive Statistics by School Year and Other Factors for School 1

	Observed Mean	Adjusted Mean	SD	n
School Year				
2011-2012 (Block)	434.77	430.45	29.62	436
2012-2013 (Trad.)	434.68	433.23	27.21	392
2013-2014 (Trad.)	441.72	438.87	27.50	421
Race				
Black	423.84	426.06	26.00	273
White	440.76	437.65	27.81	866
Other	440.98	438.84	28.46	110
Gifted				
Yes	469.59	449.35	21.01	157
No	432.41	419.02	26.11	1092
Econ. Disad.				
Yes	428.68	431.21	26.41	416
No	441.28	437.16	28.35	833
SWD				
Yes	405.82	419.23	24.30	117
No	440.32	449.14	26.72	1132
Sex				
Female	440.17	436.80	27.66	636
Male	433.88	431.56	28.70	613

Table 17

ANOVA Summary for 11th Grade English Test Scale Score by School Year and Other Factors for School 1

Source	SS	Df	MS	F
School Year	2740.06	2	1370.03	2.59
Race	26565.55	2	13282.77	25.15*
Gifted	118071.71	1	118071.71	223.54*
Econ. Disad.	8729.19	1	8729.19	16.53*
SWD	88859.09	1	88859.09	168.24*
Sex	8354.26	1	8354.26	15.82*
School Year * Race	656.11	4	164.03	.31
School Year * Gifted	755.86	2	377.93	.72
School Year * Econ. Disad.	218.40	2	109.20	.21
School Year * SWD	1302.69	2	651.34	1.23
School Year * Sex	590.26	2	295.13	.56
Error	648606.35	1228	528.18	

Note: $R^2 = .35$, adj. $R^2 = .34$.

* $p < .01$

Table 18

Comparisons of Mean Differences in 11th Grade English Test Scale Scores by School Year and Race for School 1

Comparison	Estimated Mean Difference	Standard Error of Difference	Bonferroni Adjusted 99% CI
School Year			
11-12 vs. 12-13	-2.78	4.14	-14.96, 9.34
11-12 vs. 13-14	-8.42	3.81	-19.64, 2.79
12-13 vs. 13-14	-5.65	3.92	-17.18, 5.88
Race			
Black vs. White	-11.59*	1.69	-16.56, -6.63
Black vs. Other	-12.78*	2.66	-20.59, -4.97
White vs. Other	-1.19	2.38	-8.18, 5.81

* $p < .01$, where p-values are adjusted using the Bonferroni method.

ANOVA results, presented in Table 17, showed that there are statistically significant mean differences in 11th Grade English scores by Race, Gifted status, Economic Disadvantage status, SWD status, and student Sex. As Table 16 showed, Gifted students scored higher, those without an economic disadvantage scored higher, those without a disability scored higher, and females scored higher. Table 18 showed multiple comparisons for School Year and Race. On average scores for the 2013-2014 year was highest with a mean score of 441.72 and a standard deviation of 27.50, and the year 2011-2012 with a mean score of 434.77 and a standard deviation of 29.62 was the lowest mean level of achievement. Table 18 results also showed that the score for Black (mean of 423.84 & SD of 26.00) students was lower than for White (mean of 440.76 & SD of 27.81) or Other (mean of 440.98 & SD of 28.46) students. There was little difference in mean scores between White and Other students. Interactions between School Year and the other factors were tested in the ANOVA model to learn whether differential performance occurred across the three years examined. Since none of the interactions were statistically significant at the .01 level, there was little statistical evidence that the pattern of mean differences found in one year varied from the other school years.

Analysis for School 2

For each of the two schools studied in this paper, three tables were presented for each subject area; Writing, Physical Science, 9th Grade English, Biology, US History, and 11th Grade English. The first table included the mean score and total number of students for each school by school year and demographic information including, race, gifted status, gender, SWD status, and SES status. The second table provided a summary of the ANOVA results of significant differences among demographic predictors. The third table for each subject area studied provided comparisons of mean differences by subject area for school year and race. Each set of tables are grouped by subject area for School 2 (19-21, 22-24, 25-27, 28-30, 31-33, and 34-36).

Table 19
Writing Test Scale Score Descriptive Statistics by School Year and Other Factors for School 2

	Observed Mean	Adjusted Mean	SD	n
School Year				
2011-2012 (Block)	216.92	214.08	24.13	440
2012-2013 (Trad.)	220.03	214.40	26.63	394
2013-2014 (Trad.)	217.93	209.42	21.32	415
Race				
Black	208.48	209.05	18.30	120
White	219.49	214.40	24.04	1025
Other	217.16	214.42	27.84	104
Gifted				
Yes	239.34	222.20	24.66	163
No	215.07	203.05	22.36	1086
Econ. Disad.				
Yes	209.54	209.79	25.51	360
No	221.75	215.46	22.58	889
SWD				
Yes	188.19	198.79	31.70	134
No	221.85	226.47	20.22	1115
Sex				
Female	224.76	215.93	19.32	528
Male	213.46	209.32	26.06	721

Table 20
ANOVA Summary for Writing Test Scale Score by School Year and Other Factors for School 2

Source	SS	Df	MS	F
School Year	1036.17	2	518.09	1.30
Race	2939.84	2	1419.92	3.56
Gifted	49753.61	1	49753.61	124.75*
Econ. Disad.	7348.17	1	7348.17	18.43*
SWD	83798.04	1	83798.04	210.11*
Sex	12636.49	1	12639.49	31.68*
School Year * Race	1066.68	4	266.67	.67
School Year * Gifted	3471.63	2	1735.82	4.35*
School Year * Econ. Disad.	1288.57	2	644.28	1.615
School Year * SWD	210.12	2	105.06	.263
School Year * Sex	2492.64	2	1246	3.12
Error	489754.64	1228	398.82	

Note: $R^2 = .32$, adj. $R^2 = .31$.
* $p < .01$

Table 21
Comparisons of Mean Differences in Writing Test Scale Scores by School Year and Race for School 2

Comparison	Estimated Mean Difference	Standard Error of Difference	Bonferroni Adjusted 99% CI
School Year			
11-12 vs. 12-13	-.329	3.48	-10.57, 9.92
11-12 vs. 13-14	4.65	3.442	-5.47, 14.78
12-13 vs. 13-14	4.98	3.48	-5.26, 15.22
Race			
Black vs. White	-5.35	2.02	-11.29, .59
Black vs. Other	-5.37	2.72	-13.37, 2.64
White vs. Other	-.02	2.08	-6.12, 6.09

* $p < .01$, where p-values are adjusted using the Bonferroni method.

ANOVA results, presented in Table 20, showed that there were statistically significant mean differences in Writing Test scores by Gifted status, Economic Disadvantage status, SWD status, student Sex and Gifted by school year. As Table 19 shows, gifted students scored higher, those without an economic disadvantage scored higher, those without a disability scored higher, and females scored higher. Table 21 showed multiple comparisons for School Year and Race. On average scores for the 2012-2013 year was highest with a mean score of 220.03 and a standard deviation of 26.63, and the years 2011-2012 with a mean score of 216.92 and a standard deviation of 24.13 and 2013-2014 with a mean score of 217.93 and a standard deviation of 21.32 produced similar mean levels of achievement. Table 21 results also showed that the score for Black (mean of 208.48 & SD of 18.30) students was lower than for White (mean of 219.49 & SD of 24.04) or Other (mean score of 217.16 & SD of 27.84) students. There was little difference in mean scores between White and Other students. Interactions between School Year and the other factors were tested in the ANOVA model to learn whether differential performance occurred across the three years examined. Interactions among Gifted students and school year were statically significant at the .01 level, while others showed none of the interactions were statistically significant at the .01 level, there was little statistical evidence that the pattern of mean differences found in one year varied from the other school years.

Table 22
Physical Science Test Scale Score Descriptive Statistics by School Year and Other Factors for School 2

	Observed Mean	Adjusted Mean	SD	N
School Year				
2011-2012 (Block)	471.49	464.52	61.98	416
2012-2013 (Trad.)	471.82	482.39	47.63	314
2013-2014 (Trad.)	475.09	461.50	54.44	375
Race				
Black	441.60	454.85	45.23	100
White	476.53	474.81	55.54	913
Other	469.72	478.76	56.36	92
Gifted				
Yes	532.97	501.24	48.45	153
No	463.13	437.70	50.40	952
Econ. Disad.				
Yes	453.87	462.08	50.56	324
No	480.66	476.86	55.77	781
SWD				
Yes	423.57	448.16	51.60	68
No	476.03	490.78	54.36	1037
Sex				
Female	467.07	461.75	50.27	507
Male	477.66	477.19	59.40	598

Table 23
ANOVA Summary for Physical Science Test Scale Score by School Year and Other Factors for School 2

Source	SS	Df	MS	F
School Year	10142.19	2	5071.09	2.29
Race	36831.60	2	18415.80	8.32*
Gifted	417038.65	1	417038.65	188.45*
Econ. Disad.	45944.05	1	45944.05	20.76*
SWD	110750.06	1	110750.06	50.05*
Sex	62788.32	1	62788.32	28.37*
School Year * Race	10645.81	4	2661.45	1.20
School Year * Gifted	7979.83	2	3989.91	1.80
School Year * Econ. Disad.	7742.79	2	3871.39	1.75
School Year * SWD	13848.67	2	6924.34	3.13
School Year * Sex	4235.59	2	2117.79	.96
Error	2398856.152	1084	2212.97	

Note: $R^2 = .30$, adj. $R^2 = .29$.
$* \ p < .01$

Table 24
Comparisons of Mean Differences in Physical Science Test Scale Scores by School Year and Race for School 2

Comparison	Estimated Mean Difference	Standard Error of Difference	Bonferroni Adjusted 99% CI
School Year			
11-12 vs. 12-13	-17.87	10.07	-47.48, 11.74
11-12 vs. 13-14	3.03	9.40	-24.62, 30.68
12-13 vs. 13-14	20.90	10.43	-9.78, 51.57
Race			
Black vs. White	-19.95*	5.13	-35.01, -4.87
Black vs. Other	-23.91*	6.91	-44.23, -3.58
White vs. Other	-3.95	5.29	-19.51, 11.61

* p < .01, where p-values are adjusted using the Bonferroni method.

ANOVA results, presented in Table 23, show that there were statistically significant mean differences in Physical Science scores by Race, Gifted status, Economic Disadvantage status, SWD status, and student Sex. As Table 22 showed, gifted students scored higher, those without an economic disadvantage scored higher, those without a disability scored higher, and males scored higher. Table 24 showed multiple comparisons for School Year and Race. On average scores for the 2013 with a mean score of -2014 year was highest with a mean score of 475.09 and standard deviation of 54.44, but similar to the years 2011-2012 and 2012-2013 with mean scores of 471.49 and 471.82 along with standard deviations of 61.98 and 47.63)were the lowest mean level of achievement. The mean scores were the same for 2011-2012 and 2012-2013. Table 24 results also showed that the score for Black (mean score of 441.60 & SD of 45.23) students was lower than for White (mean score of 476.53 & SD of 55.54) or Other (mean of 469.72 & SD of 56.36) students. There was little difference in mean scores between White and Other students. Interactions between School Year and the other factors were tested in the ANOVA model to learn whether differential performance occurred across the three years examined. Interactions between black students and white students as well as black students and other students were statistically significant at the .01 level.

Table 25
U.S. History Test Scale Score Descriptive Statistics by School Year and Other Factors for School 2

	Observed Mean	Adjusted Mean	SD	n
School Year				
2011-2012 (Block)	440.71	445.19	43.97	374
2012-2013 (Trad.)	452.15	439.26	52.27	331
2013-2014 (Trad.)	459.19	459.21	44.15	339
Race				
Black	426.00	438.68	42.77	85
White	453.17	452.84	47.77	871
Other	445.88	452.14	40.98	88
Gifted				
Yes	493.57	471.65	40.54	160
No	442.52	424.12	44.26	884
Econ. Disad.				
Yes	437.70	442.25	44.69	263
No	454.60	453.52	47.56	781
SWD				
Yes	420.89	433.89	50.08	63
No	452.23	461.88	46.62	981
Sex				
Female	442.13	438.51	44.68	498
Male	457.83	457.26	48.61	546

Table 26
ANOVA Summary for U.S. History Test Scale Score by School Year and Other Factors for School 2

Source	SS	Df	MS	F
School Year	8920.02	2	4460.01	2.67
Race	14385.79	2	7192.90	4.30*
Gifted	295140.71	1	295140.71	176.58*
Econ. Disad.	22924.60	1	22924.60	13.72*
SWD	44462.94	1	44462.94	26.60*
Sex	88903.88	1	88903.88	53.19*
School Year * Race	9432.06	4	2358.02	1.41
School Year * Gifted	1950.75	2	975.37	.58
School Year * Econ. Disad.	21764.84	2	10882.42	6.51*
School Year * SWD	15030.35	2	7515.17	4.50*
School Year * Sex	7284.29	2	3642.14	2.18
Error	1709878.96	1023	1671.44	

Note: $R^2 = .27$, adj. $R^2 = .26$.
* $p < .01$

Table 27
Comparisons of Mean Differences in U.S. History Test Scale Scores by School Year and Race for School 2

Comparison	Estimated Mean Difference	Standard Error of Difference	Bonferroni Adjusted 99% CI
School Year			
11-12 vs. 12-13	5.92	8.49	-19.07, 30.91
11-12 vs. 13-14	-14.02	8.74	-39.72, 11.68
12-13 vs. 13-14	-19.94	8.82	-45.89, 6.01
Race			
Black vs. White	-14.16	4.83	-28.37, .07
Black vs. Other	-13.46	6.31	-32.01, 5.09
White vs. Other	.70	4.62	-12.89, 14.29

* p < .01, where p-values are adjusted using the Bonferroni method.

ANOVA results, presented in Table 26, show that there were statistically significant mean differences in U.S. History scores by Race, Gifted status, Economic Disadvantage status, SWD status, and student Sex. As Table 25 showed, gifted students scored higher, those without an economic disadvantage scored higher, those without a disability scored higher, and males scored higher. Table 27 showed multiple comparisons for School Year and Race. On average scores for the 2013-2014 year was highest with a mean score of 459.19 and a standard deviation of 44.15, and the year 2011-2012 with a mean score of 440.71 and a standard deviation of 43.97 was the lowest mean level of achievement. Table 27 results also showed that the score for Black students was lower than for White or Other students. There is 13-14 point difference in mean scores between Black (mean of 426.00 & SD of 42.77) and Other (mean of 445.88 & SD of 40.98) students as well as Black and White (mean of 453.17 & SD of 47.77) students. Interactions between School Year and the other factors were tested in the ANOVA model to learn whether differential performance occurred across the three years examined. Interactions between school year and students that are economically disadvantages and interactions between school year and students with disabilities were statically significant at the .01 level. No other interactions were statistically significant at the .01 level.

Table 28
9^{th} Grade English Test Scale Score Descriptive Statistics by School Year and Other Factors for School 2

	Observed Mean	Adjusted Mean	SD	n
School Year				
2011-2012 (Block)	444.15	439.55	30.70	378
2012-2013 (Trad.)	446.51	444.39	30.25	390
2013-2014 (Trad.)	450.41	453.16	32.23	383
Race				
Black	433.84	440.71	32.97	121
White	449.07	449.09	30.37	952
Other	442.69	447.31	32.58	78
Gifted				
Yes	482.28	463.36	24.52	147
No	441.88	428.04	28.57	1004
Econ. Disad.				
Yes	436.31	441.31	31.02	367
No	452.06	450.09	29.93	784
SWD				
Yes	416.64	433.18	23.49	89
No	449.58	458.22	30.36	1062
Sex				
Female	452.26	449.00	30.54	552
Male	442.23	442.40	30.95	599

Table 29
ANOVA Summary for 9^{th} Grade English Test Scale Score by School Year and Other Factors for School 2

Source	SS	Df	MS	F
School Year	5415.27	2	2707.64	3.93
Race	7177.04	2	3588.52	5.21*
Gifted	150238.33	1	150238.33	218.12*
Econ. Disad.	17591.40	1	17591.40	25.54*
SWD	47900.64	1	47900.64	69.55*
Sex	12092.16	1	12092.16	17.56*
School Year * Race	5120.60	4	1280.15	1.86
School Year * Gifted	827.02	2	413.51	.60
School Year * Econ. Disad.	4595.28	2	2297.64	3.34
School Year * SWD	960.23	2	480.12	.70
School Year * Sex	695.13	2	347.56	.51
Error	778317.65	1023	688.78	

Note: $R^2 = .30$, adj. $R^2 = .29$.
* $p < .01$

Table 30
Comparisons of Mean Differences in 9th Grade English Test Scale Scores by School Year and Race for School 2

Comparison	Estimated Mean Difference	Standard Error of Difference	Bonferroni Adjusted 99% CI
School Year			
11-12 vs. 12-13	-4.85	5.19	-20.12, 10.43
11-12 vs. 13-14	-13.62	4.93	-28.11, .87
12-13 vs. 13-14	-8.77	5.14	-23.89, 6.34
Race			
Black vs. White	-8.38*	2.60	-16.03, -.73
Black vs. Other	-6.60	3.86	-17.94, 4.74
White vs. Other	1.78	3.15	-7.50, 11.05

* $p < .01$, where p-values are adjusted using the Bonferroni method.

ANOVA results, presented in Table 29, showed that there are statistically significant mean differences in 9th Grade English scores by Race, Gifted status, Economic Disadvantage status, SWD status, and student Sex. As Table 28 showed, Gifted students scored higher, those without an economic disadvantage scored higher, those without a disability scored higher, and females scored higher. Table 30 showed multiple comparisons for School Year and Race. On average scores for the 2013-2014 year was highest with a mean of 450.41 and a standard deviation of 32.23, and the year 2011-2012 with a mean score of 444.15 and a standard deviation of 30.70 was the lowest mean level of achievement. Scores for the 2012-2013 (mean of 446.51 & SD of 30.25) were similar to 2013-2014. Table 30 results also showed that the score for Black students was lower than for White or Other students. There was little difference in mean scores between White and Other students. Interactions between School Year and the other factors were tested in the ANOVA model to learn whether differential performance occurred across the three years examined. Since none of the interactions were statistically significant at the .01 level, there is little statistical evidence that the pattern of mean differences found in one year varied from the other school years.

Table 31

Biology Test Scale Score Descriptive Statistics by School Year and Other Factors for School 2

	Observed Mean	Adjusted Mean	SD	n
School Year				
2011-2012 (Block)	431.62	429.32	34.82	420
2012-2013 (Trad.)	438.63	430.64	34.20	416
2013-2014 (Trad.)	447.82	454.58	31.93	313
Race				
Black	424.15	431.85	34.55	113
White	440.33	440.00	34.12	956
Other	437.89	442.69	33.15	80
Gifted				
Yes	473.60	456.00	29.66	148
No	433.39	420.36	31.95	1001
Econ. Disad.				
Yes	427.05	433.49	32.90	366
No	443.95	442.87	33.78	783
SWD				
Yes	403.96	425.01	37.70	78
No	441.09	451.34	32.77	1071
Sex				
Female	438.70	436.13	31.99	543
Male	438.45	440.23	36.45	606

Table 32

ANOVA Summary for Biology Test Scale Score by School Year and Other Factors for School 2

Source	SS	Df	MS	F
School Year	16857.23	2	8428.62	9.72*
Race	7348.345	2	3674.17	4.24*
Gifted	153449.35	1	153449.35	176.89*
Econ. Disad.	19635.00	1	19635.00	22.63*
SWD	43855.16	1	43855.16	50.55*
Sex	4532.45	1	4532.45	5.23
School Year * Race	4009.99	4	1002.50	1.16
School Year * Gifted	2188.47	2	1094.23	1.26
School Year * Econ. Disad.	1176.41	2	588.20	.68
School Year * SWD	6315.29	2	3157.65	3.64
School Year * Sex	979.34	2	489.67	.56
Error	978535.15	1128	867.50	

Note: $R^2 = .28$, adj. $R^2 = .27$.

* $p < .01$

Table 33
Comparisons of Mean Differences in Biology Test Scale Scores by School Year and Race for School 2

Comparison	Estimated Mean Difference	Standard Error of Difference	Bonferroni Adjusted 99% CI
School Year			
11-12 vs. 12-13	-1.32	5.55	-17.65, 15.00
11-12 vs. 13-14	-25.26*	6.15	-43.36, -7.17
12-13 vs. 13-14	-23.94*	6.36	-42.64, -5.24
Race			
Black vs. White	-8.15	3.01	-16.99, .70
Black vs. Other	-10.85	4.37	-23.71, 2.02
White vs. Other	-2.70	3.52	-13.04, 7.64

* p < .01, where p-values are adjusted using the Bonferroni method.

ANOVA results, presented in Table 32, showed that there are statistically significant mean differences in Biology scores by Race, Gifted status, Economic Disadvantage status, and SWD status. As Table 31 shows, gifted students scored higher, those without an economic disadvantage scored higher, those without a disability scored higher, and males and females scored the same. Table 33 showed multiple comparisons for School Year and Race. On average scores for the 2013-2014 year was highest with a mean of 447.82 and a standard deviation of 31.93, and the year 2011-2012 with a mean of 431.62 and a standard deviation of 34.82 was the lowest mean level of achievement. The mean score increased each year from 2011 to 2014. Table 33 results also show that the score for Black (mean of 424.15 & SD of 34.55) students was lower than for White (mean of 440.33 & SD of 34.12) or Other (mean of 437.89 & SD of 33.15) students. There is little difference in mean scores between White and Other students. Interactions between School Year and the other factors were tested in the ANOVA model to learn whether differential performance occurred across the three years examined. Since none of the interactions were statistically significant at the .01 level, there was little statistical evidence that the pattern of mean differences found in one year varied from the other school years.

Table 34
11^{th} Grade English Test Scale Score Descriptive Statistics by School Year and Other Factors for School 2

	Observed Mean	Adjusted Mean	SD	n
School Year				
2011-2012 (Block)	440.90	438.42	27.46	351
2012-2013 (Trad.)	441.54	431.62	24.22	337
2013-2014 (Trad.)	450.11	444.25	27.43	347
Race				
Black	429.57	432.25	24.28	86
White	446.15	442.72	26.47	865
Other	439.09	439.32	26.97	84
Gifted				
Yes	474.69	454.29	22.65	160
No	438.62	421.90	23.48	875
Econ. Disad.				
Yes	436.09	434.88	25.12	242
No	446.67	441.32	26.75	793
SWD				
Yes	412.28	424.18	27.05	67
No	446.40	452.01	25.29	968
Sex				
Female	448.11	440.28	24.98	484
Male	440.75	435.92	27.78	551

Table 35
ANOVA Summary for 11^{th} Grade English Test Scale Score by School Year and Other Factors for School 2

Source	SS	Df	MS	F
School Year	3505.22	2	1752.61	3.88
Race	8412.55	2	4206.28	9.314*
Gifted	136926.44	1	136926.44	303.19*
Econ. Disad.	7202.29	1	7202.29	15.95*
SWD	45870.40	1	45870.40	101.57*
Sex	4700.00	1	4700.00	10.41*
School Year * Race	736.83	4	184.21	.41
School Year * Gifted	3922.90	2	1961.45	4.34*
School Year * Econ. Disad.	277.85	2	138.93	.31
School Year * SWD	2033.06	2	1016.53	2.25
School Year * Sex	2340.32	2	1170.16	2.59
Error	457948.77	1014	451.63	

Note: $R^2 = .38$, adj. $R^2 = .37$.
* $p < .01$

Table 36
Comparisons of Mean Differences in 11th Grade English Test Scale Scores by School Year and Race for School 2

Comparison	Estimated Mean Difference	Standard Error of Difference	Bonferroni Adjusted 99% CI
School Year			
11-12 vs. 12-13	6.80	4.43	-6.24, 19.84
11-12 vs. 13-14	-5.83	4.69	-19.62, 7.97
12-13 vs. 13-14	-12.63	4.56	-26.04, .79
Race			
Black vs. White	-10.47*	2.49	-17.80, -3.14
Black vs. Other	-7.07	3.34	-16.88, 2.75
White vs. Other	3.40	2.47	-3.85, 10.66

* $p < .01$, where p-values are adjusted using the Bonferroni method.

ANOVA results, presented in Table 35, show that there were statistically significant mean differences in 11th Grade English scores by Race, Gifted status, Economic Disadvantage status, SWD status, and student Sex. As Table 34 showed, gifted students scored higher, those without an economic disadvantage scored higher, those without a disability scored higher, and females scored higher. Table 36 showed multiple comparisons for School Year and Race. On average scores for the 2013-2014 year was highest with a mean score of 450.11 and a standard deviation of 27.43, and the year 2011-2012 with a mean score of 440.90 and a standard deviation of 27.46 was the lowest mean level of achievement. Table 36 results also showed that the score for Black (mean of 429.57 & SD of 24.28) students was lower than for White (mean of 446.15 & SD of 26.47) or Other (mean of 439009 & SD of 26.97) students. There was little difference in mean scores between White and Other students. Interactions between School Year and the other factors were tested in the ANOVA model to learn whether differential performance occurred across the three years examined. Interactions among school year and gifted students were statistically significant at the .01 level. None of the other interactions were statistically significant at the .01 level, there is little statistical evidence that the pattern of mean differences found in one year varied from the other school years.

Chapter Summary

Valid scores were reported from two schools in rural South Georgia from five Georgia End-Of-Course Exams and one Georgia High School Writing Test. After carefully reviewing each subject areas data and performing ANOVA computations for each subject and both high schools, there were some common themes that emerged from the study:

After an in-depth study and analysis of a Test score comparison between block and traditional scheduling of two schools and twelve subject areas, the results indicated a significant difference in mean scores by school year in two of the twelve subjects. Writing scores at School 1 were significantly different indicating the change from block to a traditional schedule was a positive move, and Biology scores at School 2 were significantly different indicating the change from block to a traditional schedule was a positive move. However, at both schools in all twelve areas, the overall mean test score slightly increased each year indicating the possibility the move from block scheduling to a more traditional scheduling model could be positive given more time.

1. School 1 ANOVA results, in all subject areas, including Writing, 9th Grade English, 11th Grade English, US History, Biology, and Physical Science show that there are statistically significant mean differences in Writing Test scores by School Year, Race, Gifted status, Economic Disadvantage status, SWD status, and student Sex.
2. School 1 Mean averages show Gifted students scored higher, those without an economic disadvantage scored higher, those without a disability scored higher, and in Writing, 9th Grade English, and 11th Grade

English females scored higher. Males scored higher in US History, Biology, and Physical Science.

3. School 1 Mean averages increased each year in the subject areas of 9th Grade English, 11th Grade English, US History, Biology, and Physical Science.
4. School 1 Mean average in the area of the Georgia High School Writing Test showed a slight increase during the 2012-2013 school year and a small decline during the 2013-2014 school term.
5. White students at School 1 had a higher Mean average than Black students during all three school years studied. Students listed as Other scored better than Black students as well in all three year studied. There was very little difference in Mean scores among White and Other students.
6. School 2 ANOVA results, in all subject areas, including Writing, 9th Grade English, 11th Grade English, US History, Biology, and Physical Science show that there are statistically significant mean differences in scores by School Year, Race, Gifted status, Economic Disadvantage status, SWD status, and student Sex.
7. School 2 Mean averages show Gifted students scored higher, those without an economic disadvantage scored higher, those without a disability scored higher, and in Writing, 9th Grade English, and 11th Grade English females scored higher. Males scored higher in US History and Physical Science. Males and females scored the same in Biology.

8. School 2 Mean averages increased each year in the subject areas of 9th Grade English, 11th Grade English, US History, Biology, and Physical Science.
9. School 2 Mean average in the area of the Georgia High School Writing Test showed a slight increase during the 2012-2013 school year and a small decline during the 2013-2014 school term.
10. White students at School 2 had a higher Mean average than Black students during all three school years studied. Students listed as Other scored better than Black students as well in all three year studied. There was very little difference in Mean scores among White and Other students.

Based on the themes described above, there is mean differences in academic achievement levels in all subject areas including Writing, Biology, US History, 9th Grade English, Physical Science, and 11th Grade English. The Writing test for both School 1 and 2 produced higher mean scores during the 2012-2013 school term when compared to 2011-2012 and 2013-2014. All other subject areas produced higher mean scores during the 2013-2014 school year compared to 2011-2012 and 2012-2013. Each of those subject areas saw an increase in scores moving from a block schedule to a traditional seven-period day. When examining the difference in academic achievement as measured by the five Georgia end of course examinations and the Georgia High School writing test based on scheduling format, block schedule or traditional schedule in the areas of race, gender, gifted status, SWD status and SES, there was a significant difference in mean scores at the $p < .01$ level in the areas of school year, race, gifted students, students not receiving free lunch, students that are not disabled, and sex for both School 1 and School 2. Throughout the analysis of this data within the research, there was little statistical evidence that a pattern of mean differences were found when examining school year and demographic factors. However, a few examples did emerge. These were outlined in the following table:

Table 37

Summary Comparisons for All Subjects tested at School 1 and School 2

Subject	School 1 Mean	F Value	School 2 Mean	F Value
Writing	215 - Block 218 - Traditional 213 - Traditional	10.30*	216 – Block 220 – Traditional 217 – Traditional	1.30
Physical Science	451 - Block 463 - Traditional 465 – Traditional	1.77	471 – Block 471 – Traditional 475 – Traditional	2.29
US History	435 - Block 434 - Traditional 446 – Traditional	1.15	440 – Block 452 – Traditional 458 – Traditional	2.67
9th Grade English	430 - Block 441 - Traditional 446 - Traditional	1.65	444 – Block 446 – Traditional 450 – Traditional	3.93
Biology	419 - Block 430 - Traditional 445 - Traditional	1.65	431 – Block 438 – Traditional 447 – Traditional	9.72*
11th Grade English	434 – Block 434 – Traditional 441 – Traditional	2.59	440 – Block 441 – Traditional 450 – Traditional	3.88

*Significant Difference in Mean Scores among school years.

CHAPTER 5

CONCLUSIONS, DISCUSSON, AND RECOMMENDATIONS

Chapter 5 provided an overview of the research project, conclusions, discussion of findings, and implications, and conclusions for recommendations for future research. The summary section provides an overview of the methods used in this research project from Chapter 3, and the findings conducted in SPSS Analysis from Chapter 4. The conclusions for Chapter 5 will link the findings of the study to the research questions. The discussion section will elaborate on the analysis of the findings based on the drawn conclusions. Finally, recommendations for future studies and current practices will be suggested.

Summary

Classroom instructional time has an impact on graduation rates (Good, 2014). How teachers use the time allocated is the only thing that is controlled 100% by the schools and directly affects students' interest in and attitudes about staying in school and graduating on time. Educational stakeholders need students graduating from Georgia schools either college or career ready and currently only two out of three students are leaving high school with a diploma (Georgia Department of Education, 2012). The purpose of this study was to examine how schools utilizing block scheduling and traditional scheduling models differ in achievement levels on the five Georgia End-of-Course Exams (EOCT) and the Georgia High School Graduation Writing test (GHSWT) at two high schools in rural South Georgia. The researcher will also investigate if there was a differential benefit in terms of higher EOCT/GHSWT scores during block or traditional scheduling when considering demographic variables student gender, race, gifted status, SWD status, or SES.

School systems have striven to increase student achievement for many years. In fact, history indicates schools have manipulated school schedules in various ways to increase student achievement (Rettig, 1999). School administrators have used a variety of schedules to manipulate the school day to help students increase test scores and overall grades; however, throughout this process, the most widely used schedules include the 4x4 block schedule and the traditional six or seven period day.

The No Child Left Behind Act of 2002 brought about a tremendous amount of pressure for schools to perform at adequate levels in order to continue receiving funding and to gain positive ratings for school improvement. Since 2002 school systems and individual schools have been challenged to reach higher levels each year under Adequate Yearly Progress (AYP) (Darling-Hammond, 2007). AYP was used as the measuring tool for schools in the State of Georgia from 2002 until 2012. In 2012, the Georgia Department of Education transitioned to a new system of accountability entitled the College and Career Readiness Index (CCRPI). Georgia was one of 10 states granted a waiver from the federal No Child Left Behind Act in February 2012. The Index helped school systems communicate with parents and the public on how schools are performing in a more comprehensive manner than the pass/fail system previously in place under Adequate Yearly Progress (AYP) (Georgia Department of Education, 2012). Therefore, as schools transition into a new accountability system, schedules come to the fore-front of decisions for high school administrators and board level employees.

To date, there were mixed reviews on the success of block scheduling at the high school level. Research has indicated that schools have tried several models of scheduling to accommodate their student body and community. There is still much indecision on what schedule works the best. Veal and Schreiber (1999) conducted studies comparing block and traditional schedules in relation to student achievement and found them to be inconclusive. Schools have attempted to emphasize higher order thinking activities under the block schedule, as well as engage students in more content, thus leading to higher student achievement; but again, the results were inconclusive. Others have attempted to trend back to the more traditional schedule, only to find student achievement successes or failures were indecisive. For my community, the two high schools utilized block scheduling from 1998 to 2012. After having transitioned back to traditional scheduling, there was a desire to determine which schedule works best in terms of the assessments required by the Georgia Department of Education. It became very important for school leaders to determine if the school schedule was related to the academic level of achievement on standardized test. The research examined in Chapter two resembled some aspects of this research, but in many cases stood alone on items as teacher morale, student perceptions, discipline rates, attendance rates, and other outlining factors that were not directly related to achievement levels on standardized test.

Building level Administrators have been experimenting with different schedules and reviewing studies surrounding different schedules (Balsimo, 205; Corley, 2003). The research conducted on block and traditional scheduling has brought about mixed results. While some school districts have supported the block schedule, others have also supported the traditional six or seven period day schedule (Simon, 2009). With an increased emphasis being placed on students performing well on standardized exams, school leaders and teachers have had to examine everything from schools schedules to fire drills, school announcements, and other interruptions that disrupt the learning during the instructional day. Achieving at high levels to maintain growth within AYP was becoming increasingly more difficult each year as the bar rises. NCLB and Race To The Top has heightened the alertness meter for school leaders to the point that a simple school schedule is researched and examined to gain an advantage from an achievement standpoint (Smith, Jr., 2011).

In each of the two schools described in this study, there was an understanding that the initial moves from a block schedule to a traditional seven-period schedule occurred primarily because of the need to save money and reduce the number of staff members on campus. The downturn of the economy raised many concerns and meeting the needs of the students with less staff was examined. The school system involved in this study felt they could save money by using fewer staff members units. As research was conducted for this study, there was no research found that left the block schedule to move to a more traditional schedule. All of the research examined favored a move to a block schedule. However, there is some research that documents schools changing from a traditional schedule to a block schedule in the 1990’s (Canady & Rettig, 1995).

For this study, Administrators needed to find out which instructional schedule works more effectively in terms of student achievement in the areas of English, Writing, Science, and Social Studies as evidenced on the five State End-of-Course Exams. The researcher compared student achievement using the type of schedule as the independent variable. Thus, the following research question guided the investigation:

1. Was there a difference in academic achievement as measured by the five Georgia end of course examinations and the Georgia High School writing test based on scheduling format, block schedule or traditional schedule?

2. Was there a difference in academic achievement as measured by the five Georgia end of course examinations and the Georgia High School writing test based on scheduling format, block schedule or traditional schedule in the areas of race, gender, Gifted status, SWD status, and SES?

Summary of Findings

In this study, the researcher found the following themes throughout the study after inputting and calculating each school's data using SPSS Statistical Software:

Valid scores were reported from two schools in rural South Georgia from five Georgia End-Of-Course Exams and one Georgia High School Writing Test. After carefully reviewing each subject areas data and performing ANOVA computations for each subject and both high schools, there are some common themes that emerged from the study:

After an in-depth study and analysis of a Test score comparison between block and traditional scheduling of two schools and twelve subject areas, the results indicate a significant difference in mean scores by school year in two of the twelve subjects. Writing scores at School 1 were significantly different indicating the change from block to a traditional schedule was a positive move, and Biology scores at School 2 were significantly different indicating the change from block to a traditional schedule was a positive move. In the other 10 areas, there is not any concrete evidence that the higher mean results were not by chance. However, at both schools in all twelve areas, the overall mean test score slightly increased each year indicating the possibility the move from block scheduling to a more traditional scheduling model could be positive given more time.

1. School 1 ANOVA results, in all subject areas, including Writing, 9th Grade English, 11th Grade English, US History, Biology, and Physical Science show that there are statistically significant mean differences in Writing Test scores by School Year, Race, Gifted status, Economic Disadvantage status, SWD status, and student Sex.
2. School 1 Mean averages show Gifted students scored higher, those without an economic disadvantage scored higher, those without a disability scored higher, and in Writing, 9th Grade English, and 11th Grade English females scored higher. Males scored higher in US History, Biology, and Physical Science.
3. School 1 Mean averages increased each year in the subject areas of 9th Grade English, 11th Grade English, US History, Biology, and Physical Science.
4. School 1 Mean average in the area of the Georgia High School Writing Test showed a slight increase during the 2012-2013 school year and a small decline during the 2013-2014 school term.
5. White students at School 1 had a higher Mean average than Black students during all three school years studied. Students listed as Other scored better

than Black students as well in all three year studied. There was very little difference in Mean scores among White and Other students. This was for all subject areas studied.

6. School 2 ANOVA results, in all subject areas, including Writing, 9th Grade English, 11th Grade English, US History, Biology, and Physical Science show that there are statistically significant mean differences in Writing Test scores by School Year, Race, Gifted status, Economic Disadvantage status, SWD status, and student Sex.
7. School 2 Mean averages show Gifted students scored higher, those without an economic disadvantage scored higher, those without a disability scored higher, and in Writing, 9th Grade English, and 11th Grade English females scored higher. Males scored higher in US History and Physical Science. Males and females scored the same in Biology.
8. School 2 Mean averages increased each year in the subject areas of 9th Grade English, 11th Grade English, US History, Biology, and Physical Science.
9. School 2 Mean average in the area of the Georgia High School Writing Test showed a slight increase during the 2012-2013 school year declined slightly during the 2013-2014school year.

10. White students at School 2 had a higher Mean average than Black students during all three school years studied. Students listed as Other scored better than Black students as well in all three year studied. There was very little difference in Mean scores among White and Other students. This was for all subject areas studied within this research.

In Summary, ANOVA results, presented in this study, showed that there were statistically significant differences in two of twelve subject areas that as a researcher indicate the move from block to a traditional schedule would be positive and beneficial without the notion of the scores being by chance. The two areas significant were Writing scores at School 1 and Biology at School 2. However, statistically significant mean differences at the .01 level in Writing, Physical Science, US History, 9th Grade English, Biology, and 11th Grade English scores by Race, Gifted status, Economic Disadvantage status, SWD status, and student Sex. This was true for both School 1 and School 2 in this study. Also, Gifted students scored higher, those without an economic disadvantage scored higher, those without a disability scored higher. Males scored higher in Physical Science, Biology, and US History. Females scored higher in Writing, 9th Grade English, and 11th Grade English. This study also shows multiple comparisons for School Year and Race. On average scores for the 2013-2014 year was highest, and the year 2011-2012 was the lowest mean level of achievement. Writing was the exception to this theme, where Writing decreased over the three year period with 2011-2012 having the highest mean average. Other results also showed that the score for Black students was lower than for White or Other students. There is little difference in mean scores between White and Other students. Interactions between School Year and the other factors were tested in the

ANOVA model to learn whether differential performance occurred across the three years examined. Very few of the interactions were statistically significant at the .01 level, therefore, there is little statistical evidence that the pattern of mean differences found in one year varied from the other school years.

Throughout Chapter two, the researcher used a variety of resources throughout the search process to gain empirical research on block and traditional scheduling. School leaders have strived to increase student achievement for many years. One way they have attempted to do this is through the change of the class schedule. In fact, studies have indicated schools have manipulated school schedules in various ways to increase student achievement (Rettig, 1999). School administrators have used various scheduling models to manipulate the school day to help students increase test scores and overall grades. Many of the research studied in this study covered issue related to perceptions of block scheduling, how teachers feel about block scheduling, overall grades in block scheduling, behavior reports under block scheduling, and in some cases how student achievement played a part in block scheduling. Most of the research available discussed the positives to block scheduling. Very little research compared the move from block scheduling to a traditional schedule comparing student achievement results on standardized test including comparisons of race, gender, and other factors related to student classifications. This particular study attempted to provide readers and school stakeholders with a breadth of information related to transitioning from a block schedule to a more traditional seven-period day schedule in relation to student achievement.

In closing, this study created a foundation for other researchers attempting to examine the transition to traditional schedules from block schedules in relation to student achievement. Although on a small scale, only covering two high schools in rural South Georgia, researchers now have a wealth of information to help guide them in their research on the move from a block schedule to a traditional schedule in terms of student success on standardized tests.

Implications

As this subject was researched and decisions within school systems across the United States are made, policy makers and school leaders have to reflect on how this study impacts students, staff members, and communities. Student achievement is still at the forefront of our educational system and directly impacts the decisions leaders of our schools make on a daily basis. The perception from the researcher was that more studies on larger scales must be conducted to be able to pull the smaller ones together. Small studies such as this are only pockets of information. Although good information derives from these small studies, larger studies covering more schools and more students on high stakes exams are needed to help inform Principals and other decision makers on the appropriate schedule that may work for their community and school. The belief is that teachers are in need of more training on how to teach within each schedule as block scheduling and traditional scheduling are very different. There was also the belief that high stakes standardized exams have created a great deal of stress throughout the educator community and more training is needed on how to handle the stress of the ever changing testing world.

Recommendations for Further Research

The data throughout this research project provided some answers for two schools in relation to a transition from block scheduling to a more traditional seven-period day schedule in regards to student achievement in the areas of Writing, Physical Science, US History, 9th Grade English, Biology, and 11th Grade English. The data also gave a snapshot of achievement levels as well in relation to gender, race, gifted student status, SWD status, and SES status. The research findings also provided detailed information on the interaction of each school year, each subject, and the other factors as gender, race, gifted students status, SWD status, and SES status. Though the data answered many questions for two schools in relation to six subjects over a three year period, it also raised other questions for further research. The following questions for further research are recommended:

Recommendation #1: Although this study found some Mean averages to be significant at certain levels between the academic achievement of students in two schools that transitioned from a block schedule to a traditional seven-period day schedule, school systems need to research other factors, such as the recruitment and retaining of solid teachers, and how the quality of a teacher with experience plays a role in student achievement.

Recommendation #2: The data within this study examined only two schools in one school system in rural south Georgia. It is recommended that further research be conducted on the transition from block scheduling to traditional scheduling in more schools as well as other parts of the State of Georgia.

Recommendation #3: School districts and school leaders should examine the perceptions of students and teachers in relation to student performance on standardized test in high schools throughout Georgia who transitioned from block scheduling to traditional scheduling.

Limitations of the Study

The following list includes the limitations of this study conducted on achievement levels in six areas in which two schools transitioned from block scheduling to a traditional seven-period day.

- The achievement levels for Writing, Physical Science, US History, 9th Grade English, Biology, and 11th Grade English test results were used as the sole measure of academic achievement in this study. This particular achievement measure does not take into account for student learning beyond test scores.
- The findings of this study were limited to two schools in one school system where the study took place.
- The findings of this study were limited to the state of Georgia where the study took place as well one area of the state of Georgia.
- The findings of this study were limited to a specific population of students receiving free or reduced lunch status. This status is identified through a self-reporting database system completed by the family of the student.

Summary

The purpose of this research study was to add to the educational research available and expand the information of this study in the area of school scheduling among high schools and the effects it has on student achievement on high stakes state mandated test. Certainly, this study did not answer all the questions related to which schedule type is better, but helped add to the knowledge base for school leaders, research specialist, and concerned stakeholders that have an interest in understanding the effects of switching school schedules and the effects it may have on high schools throughout the United States (Schott, 2008). The data from this study indicated the move from a block schedule to a traditional seven period day schedule is beneficial in two subject areas as indicated in the study. The data would also support the move from block to a traditional schedule could be beneficial in the long run because of the slight Mean increase each year in each subject at both schools. This study has also attempted to provide stakeholders and academic school researchers with a data based example to better equip them to make the decision to move from block scheduling to a traditional schedule. Finally, the purpose of this study was to examine two high schools in rural South Georgia and examine which type of scheduling model – the block schedule or the traditional schedule-result in higher student scores on the Georgia End-of Course examinations and the Georgia High School writing test? This quantitative investigation helped make the determination if the move was effective or not.

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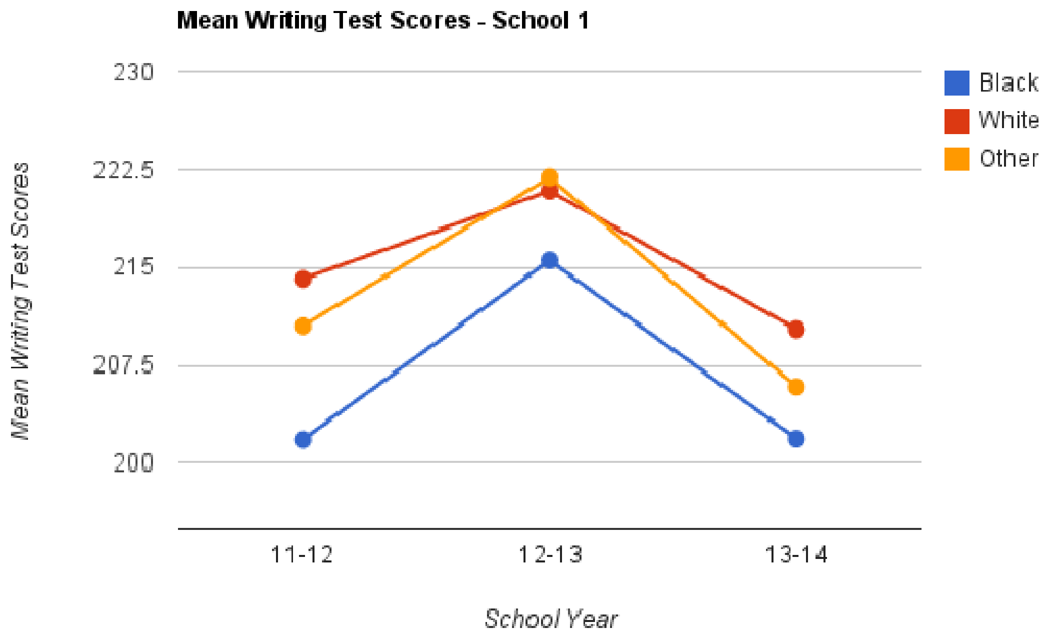
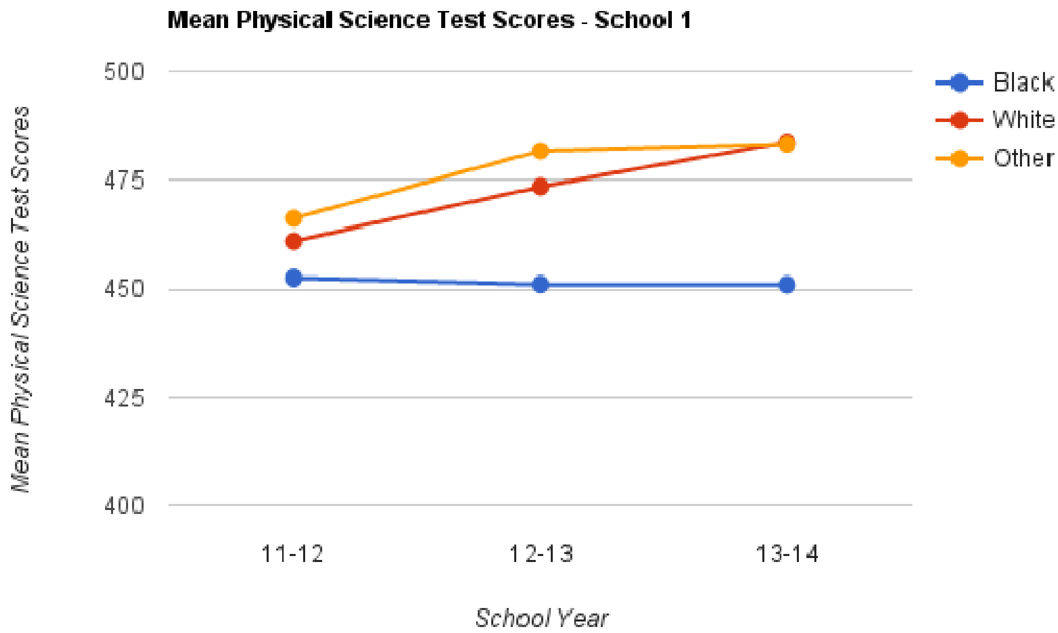
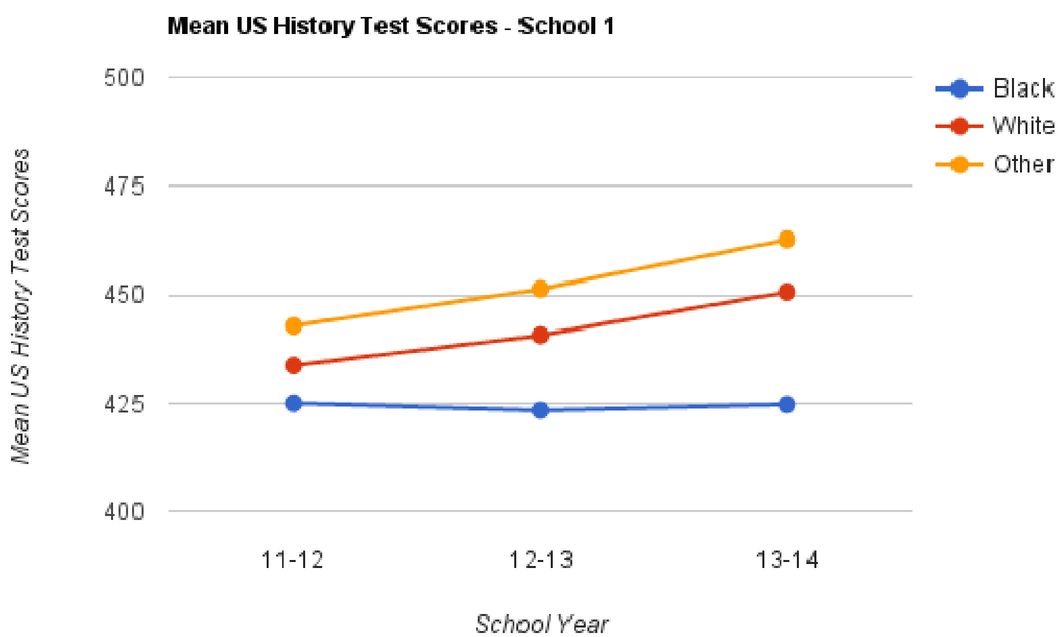
Appendix I

The following charts are analysis of Mean ANOVA interactions among race indicators for each school year and each subject area tested in this study for School 1 and School 2.




Mean Physical Science Test Scores - School 1
500
475
450
425
400
Mean Physical Science Test Scores
11-12
12-13
13-14
School Year
Black
White
Other


Mean US History Test Scores - School 1
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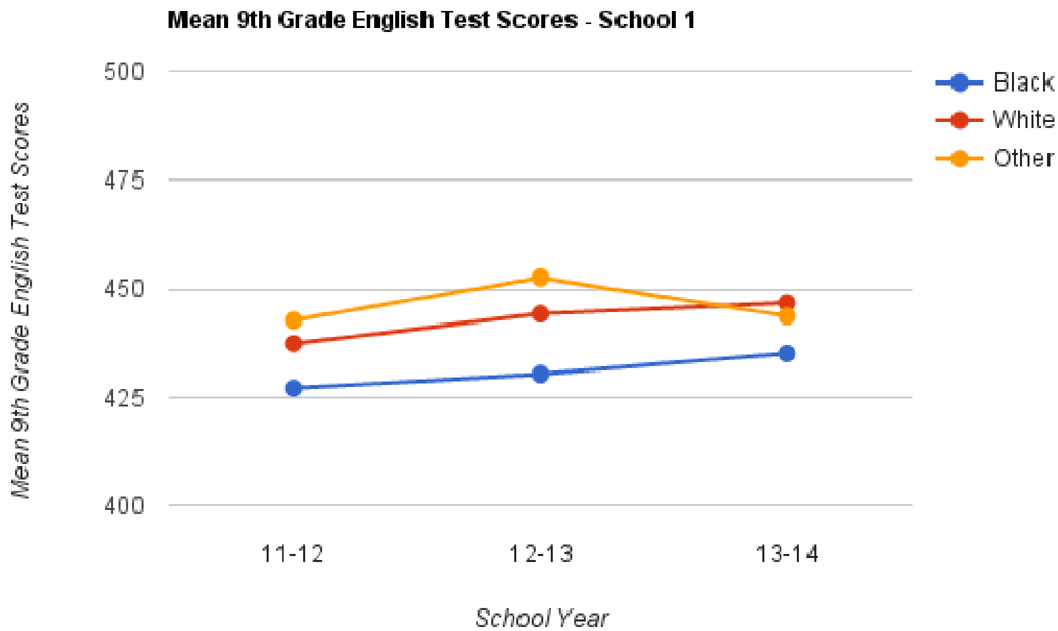
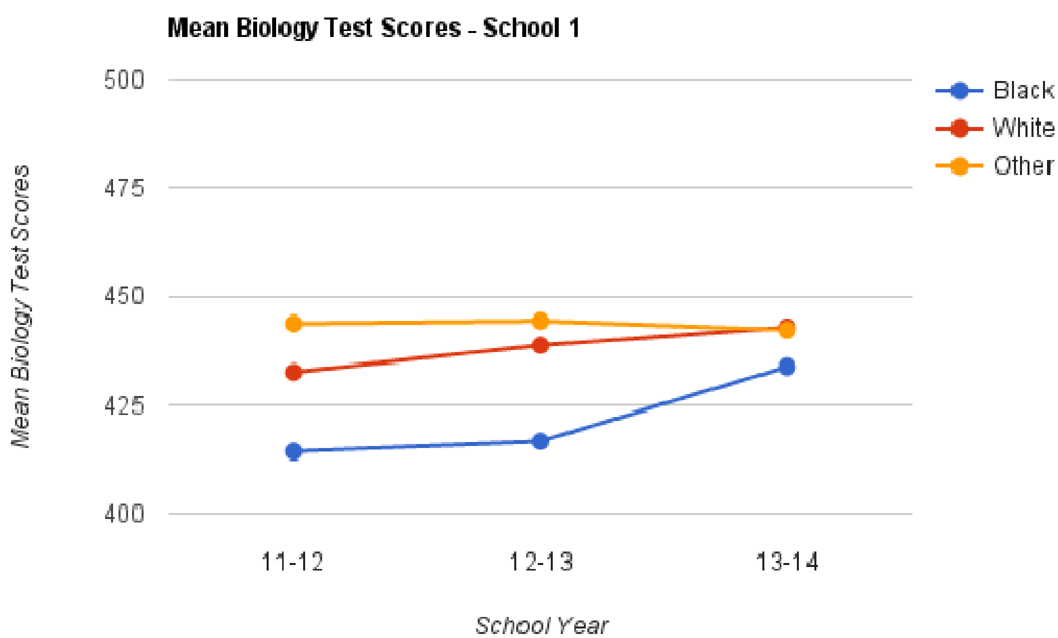
475
450
425
400
Mean US History Test Scores
11-12
12-13
13-14
School Year
Black
White
Other


Mean 9th Grade English Test Scores - School 1
500
475
450
425
400
Mean 9th Grade English Test Scores
11-12
12-13
13-14
School Year
Black
White
Other


Mean Biology Test Scores - School 1
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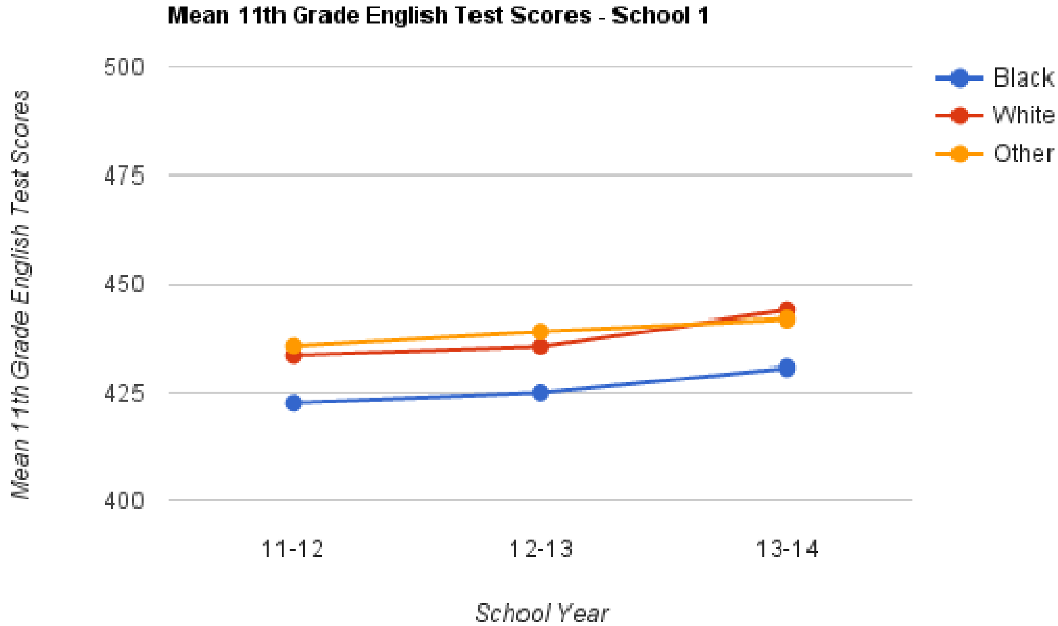
475
450
425
400
Mean Biology Test Scores
11-12
12-13
13-14
School Year
Black
White
Other


Mean 11th Grade English Test Scores - School 1
Mean 11th Grade English Test Scores
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School Year
Black
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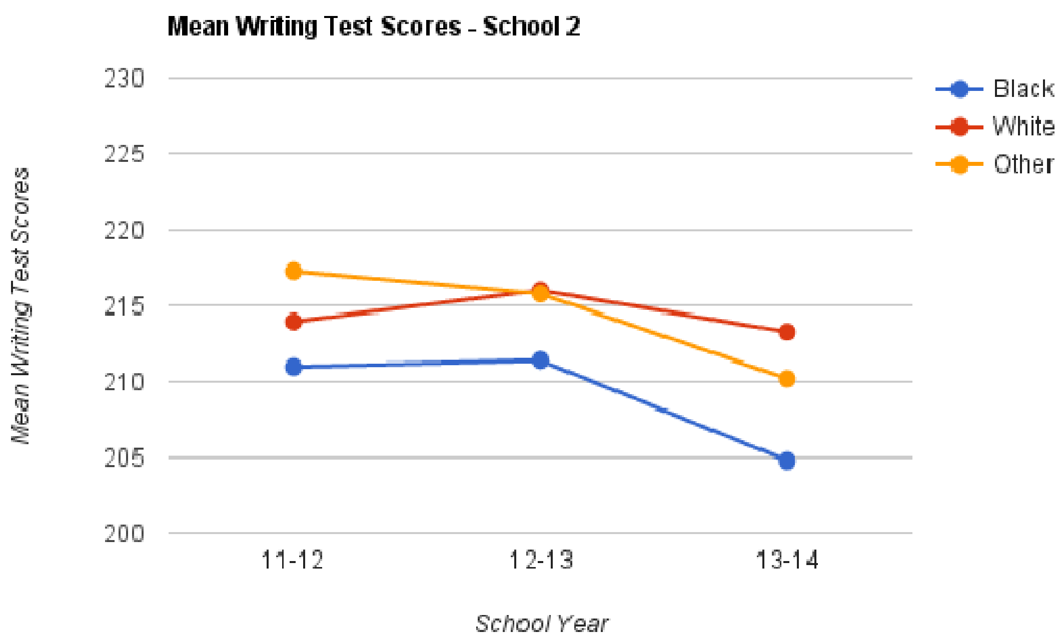
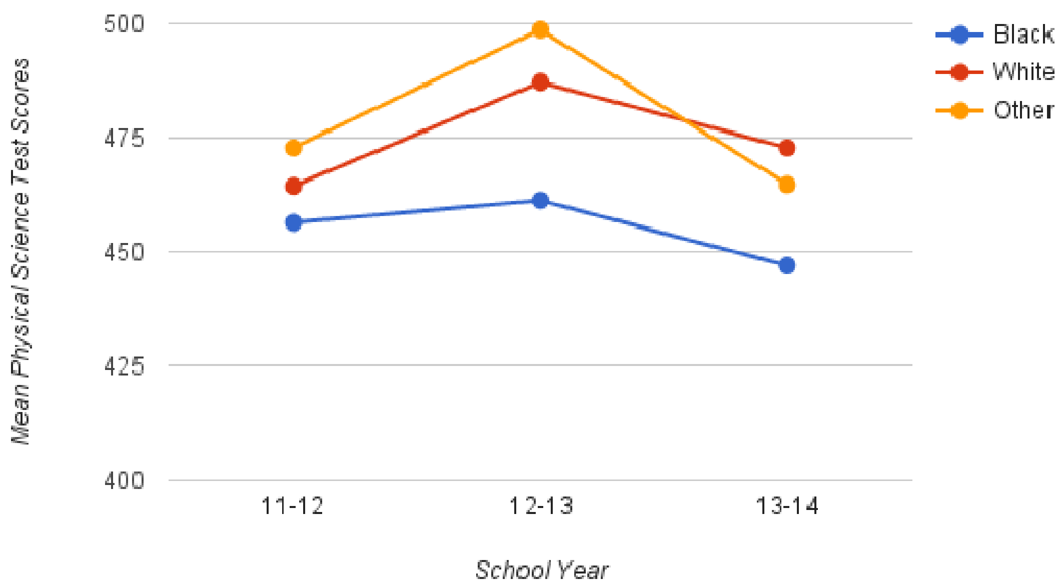
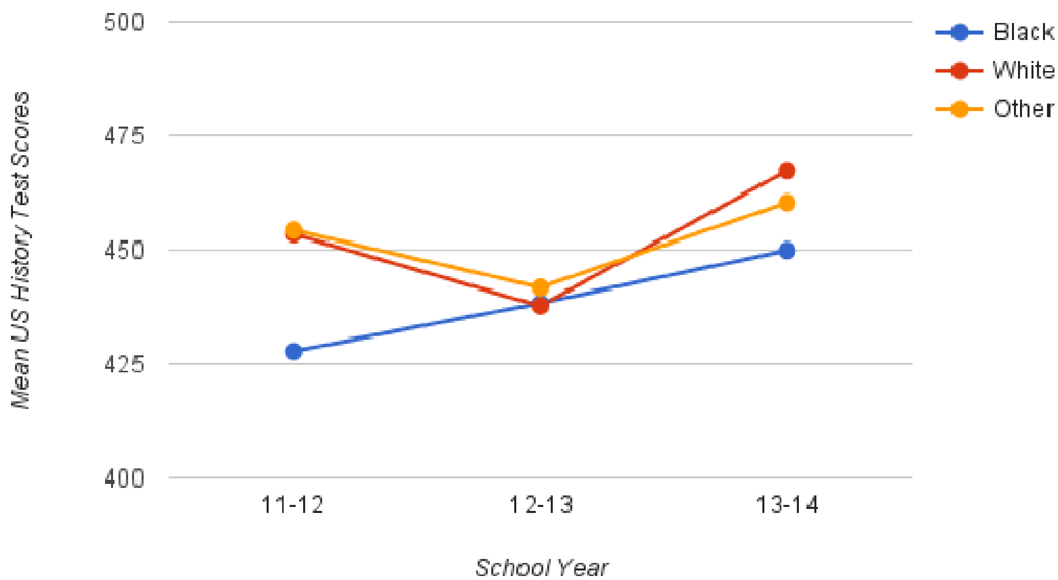
Other

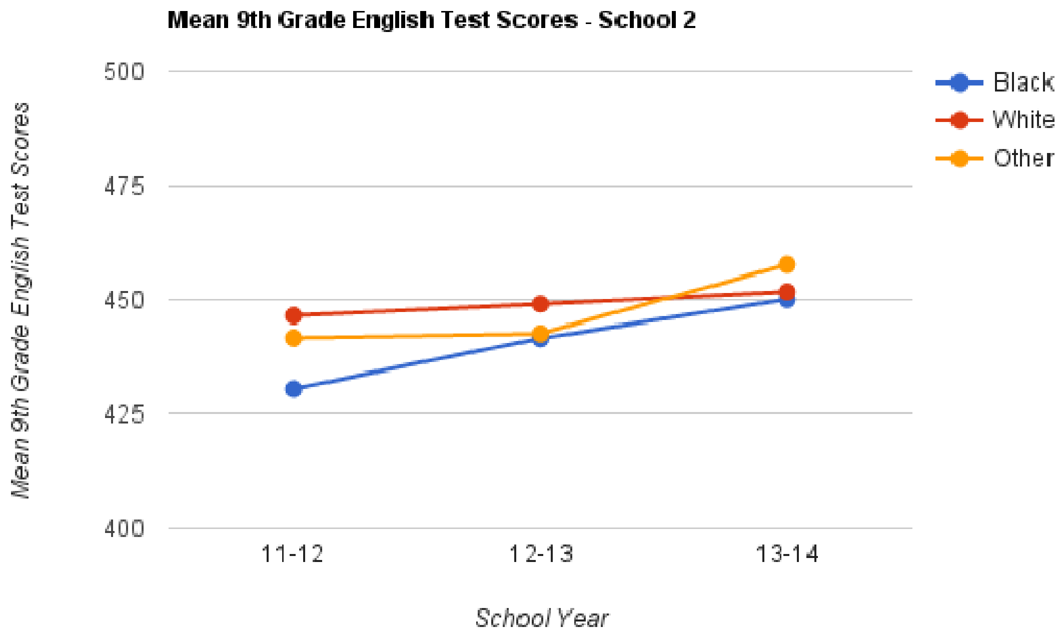

Mean Writing Test Scores - School 2
Mean Writing Test Scores
230
225
220
215
210
205
200
11-12
12-13
13-14
School Year
Black
White
Other

Mean Physical Science Test Scores - School 2



Mean US History Test Scores - School 2




Mean 9th Grade English Test Scores - School 2
Mean 9th Grade English Test Scores
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School Year
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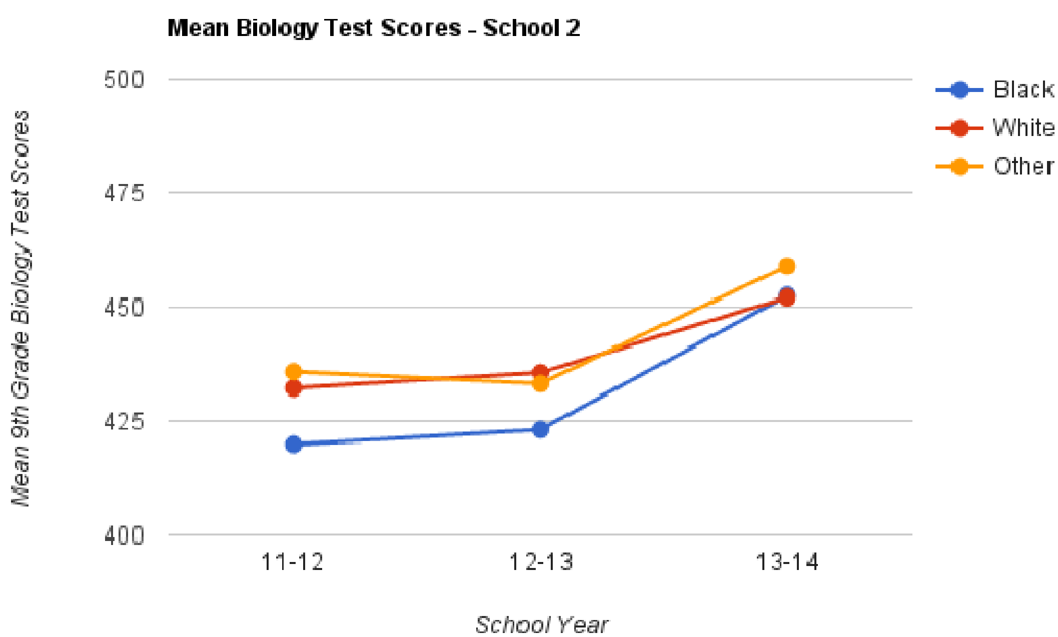
Other


Mean Biology Test Scores - School 2
Mean 9th Grade Biology Test Scores
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School Year
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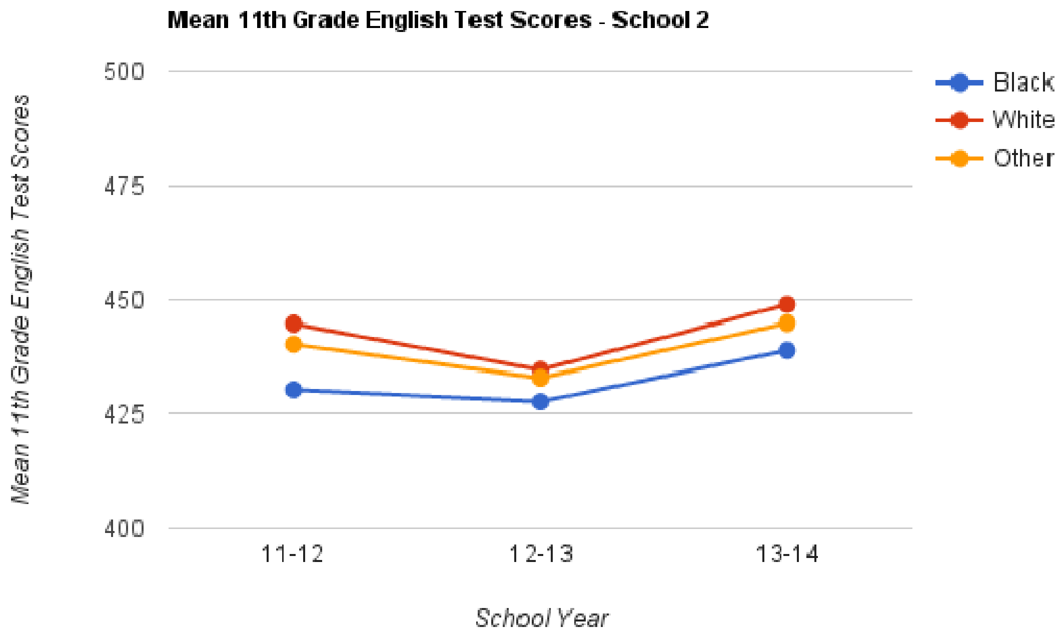
Mean 11th Grade English Test Scores - School 2
Mean 11th Grade English Test Scores
500
475
450
425
400
11-12
12-13
13-14
School Year
Black
White
Other

Appendix II

Georgia Southern University
Office of Research Services & Sponsored Programs

Institutional Review Board (IRB)

Phone: 912-478-0843 | Veazey Hall 2021, P.O. Box 8005
Fax: 912-478-0719 | IRB@GeorgiaSouthern.edu | Statesboro, GA 30460

To: Yancy Ford
Dr. Jason LaFrance
Dr. Bryan Griffin

From: Office of Research Services and Sponsored Programs
Administrative Support Office for Research Oversight Committees (IACUC/IBC/IRB)

Approval Date: 3/6/15

Subject: Status of Application for Approval to Utilize Human Subjects in Research

After a review of your proposed research project numbered **H15335** and titled **"A Test Score Comparison Between Block and Traditional Scheduling,"** it appears that your research involves activities that do not require full approval by the Institutional Review Board (IRB) according to federal guidelines.

According to the Code of Federal Regulations Title 45 Part 46, your research protocol is determined to be exempt from full review under the following exemption category(s):

B4 Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

Any alteration in the terms or conditions of your involvement may alter this approval. *Therefore, as authorized in the Federal Policy for the Protection of Human Subjects, I am pleased to notify you that your research, as submitted, is exempt from IRB approval. No further action or IRB oversight is required, as long as the project remains the same. If you alter the project, it is your responsibility to notify the IRB and acquire a new determination of exemption. Because this project was determined to be exempt from further IRB oversight, this project does not require an expiration date.*

Sincerely,

Ele Haynes (SS)

Eleanor Haynes
Compliance Officer

Effingham County Board of Education

405 N. Ash St., Springfield, Ga, 31329 • (912) 754-6491 • FAX 912-754-7033

Superintendent
Randy Shearouse

Assistant Superintendent
Gregory Arnsdorff

APPLICATION TO CONDUCT RESEARCH IN EFFINGHAM COUNTY SCHOOL DISTRICT

Applications to conduct research that involves students, parents, or staff of Effingham County School District will be reviewed by the Assistant Superintendent or designated Office of Instruction and Technology staff. Research guidelines incorporated in this application are designed to protect the confidentiality of human subjects and guarantee the integrity and quality of any research conducted in the district. In addition, proposed research cannot be conducted during state testing period, must not violate state education codes related to privacy and family values, may not create a data burden on teachers or schools, and is entirely voluntary on the part of the participants.

This application will ensure that your proposal is properly aligned with current district policy and the district research priorities. If the research is a graduate student, we require a supporting letter from the graduate advisor.

Please complete the following form and attach clearly labeled additional pages as needed. Please allow 30 working days for a response from the District. All approved research must be conducted under the supervision of the school principal or other designated administrator.

Part 1 – Study Information

Study Title: A Test Score Comparison Between Block and Traditional scheduling	Researcher Name(s): Yancy J. Ford
Address:3675 Midland Road	City, State, Zip:Guyton, Ga 31312
Telephone:912-213-2493	Fax:912-754-6893
Email: yford@effingham.k12.ga.us	Name of College or University represented by Researcher: Georgia Southern University
Class & Degree Sought: EDD	Study Timeline: (beginning and ending) January 2015 - May 2015
Major Data Collection Timeline: January 2015 - February 2015	Places where Data will be Collected: ECHS and SEHS
What tasks/activities will subjects be asked to complete, with an estimate of amount of time it would take to complete (such as filling out a survey, participating in an interview, observing a classroom):	
The purpose of this study is to examine how block scheduling and traditonal scheduling models differ in achievement levels on the five Georgia End-of-Course Exams and the Georgia High School Graduation Writing test at two high school in rural South Georgia. The study will also examine scores in the areas of sex, race, SES, and classification.	
Please attach a copy of any instrumentation to be used. This includes, but is not limited to, surveys, tests, consent forms, and data recording sheets.	
Significance of Study to ECBOE: To inform key stakeholders on the achievement levels between block and traditional scheduling in the area of State EOCT's.	Significance of Study to Field of Education: To inform outside researchers and community stakeholders if their is a differential benefit in terms of higher EOCT/GHSWT scores during block or traditonal scheduling.

Effingham County Board of Education
405 N. Ash St., Springfield, Ga, 31329 • (912) 754-6491 • FAX 912-754-7033

Superintendent
Randy Shearouse

Assistant Superintendent
Gregory Arnsdorff

STATEMENT OF AGREEMENT FOR RESEARCHERS

Title of Research Project: A Test Score Comparison Between Block and Traditonal Scheduling

The proposed activities to be conducted in Effingham County School District are in compliance with existing legal and ethical codes. The research will not differ significantly from the activities described within the proposal. Any amendments to the original proposal must be submitted to and approved by the Office of Instruction and Technology. All participation in the study will be voluntary and confidentiality of the data will be maintained. All researchers agree to provide the Office of Instruction and Technology of the Effingham County School District a copy of the final research report. Researchers agree to ensure that all associates, colleagues, and employees assisting in the conduct of the study are informed about their obligations in meeting the research study commitments.

I understand and agree with the above statement and will follow the guidelines it sets forth.

Date: 1/13/2015

Printed Name
Yancy J. Ford

Signature:
Yancy J. Ford

Approved by: Title: Asst. Superintendent Date: 1/14/2015

Please mail or fax the signed document to:

Assistant Superintendent
Effingham County School District
405 N. Ash Street
Springfield, GA 31329
Fax: (912) 754-5637

Equal Opportunity Employer

Part 2 - Graduate Study

If the researcher is a graduate student, please complete the following: If not, go to Part 3.	
Graduate Advisor Name: Dr. Jason LaFrance	Telephone: 912-478-5642
Title: Associate Professor	Fax Number:
Department: Educational Leardership	Email: jlafrance@georgiasouthern.edu

Please attach the following:

1. A copy of the research proposal
2. A letter from graduate advisor *denoting* approval of the *thesis* or dissertation.

Part 3 – Subject Information

Description of Participants to be Involved: Score Reports Only / No Names	Number of Participants to be Involved:
Potential Risks/Hazards to Subject:	Expected Benefits to Subject:
Proposed Reward/Incentive to Subject:	How will Subjects be Recruited/Selected?
How will you assure participation is voluntary?	What provisions will be made for subjects not willing to participate?

If the research project is associated with an institution that requires a formal human subjects review, a copy of the human subjects review committee approval is required prior to final approval. The Family Education Rights and Privacy Act (FERPA) regulations can be found posted as a PDF with this document.

I certify that this completed research application is an accurate and complete statement of the nature of my research. I further agree that this research does not involve coercion, deception, or psychological manipulation of any Effingham County School District participant.

Researcher Signature

1/13/2015

Date

Equal Opportunity Employer