# A STUDY OF THE EFFECT OF 4 X 4 BLOCK SCHEDULING ON COMPOSITE ACT SCORES

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# A STUDY OF THE EFFECT OF 4 X 4 BLOCK SCHEDULING ON COMPOSITE ACT SCORES

A Field Study

Presented to

The Faculty of the Graduate School

Austin Peay State University

by

Shannon Salyer Bryant

In Partial Fulfillment

of the Requirements for the Degree of

Education Specialist

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# DEDICATION

I can think of no one more deserving of this dedication than my loving family. My husband and daughter have sacrificed much so that I could complete this endeavor; to them I am eternally grateful. To my parents I owe a debt of gratitude as well, for they instilled in me the will to succeed and always pursue my goals. I dedicate this study to my family whose love, support, and sacrifice allowed me the opportunity to complete this project. Lacy, my dearest daughter, may you value your ability to learn and grow throughout your life as much as I love and value you.

# ACKNOWLEDGEMENTS

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# ABSTRACT

The purpose of this study was to determine if converting to a 4 X 4 block schedule from a traditional six period schedule during the 1995-1996 school year had an impact on composite ACT scores of high school students in Cheatham County, Tennessee. Data analyses on the factors of gender, ethnicity, and school attended were also examined. The mean composite ACT score after implementation was 1.445 points higher than prior to implementation. Findings indicated there was a statistically significant difference ($\alpha$=.05) in the scores of students after the implementation of block scheduling.

It was concluded that composite ACT scores of Cheatham County seniors rose significantly after the implementation of the 4 X 4 block schedule but this increase in score was not significant with regards to gender, or school attended. The factor of ethnicity was unable to be studied with statistical significance due to lack of adequate sample size of ethnically diverse students. Additional studies of longer duration in larger more diverse populations are recommended that will further examine the effects block scheduling may have on composite ACT scores in schools with varying demographics. It is also recommended that composite ACT scores be disaggregated into their disciplines to determine the degree to which block scheduling impacts each of these disciplines.

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# Chapter I

## Introduction to Study

### *Introduction*

Educational reform and its elements are continually analyzed. It seems that fresh and innovative ideas, programs, curricula, and interventions are constantly being implemented, evaluated, and perfected. The reform of school scheduling is no different. While each school system, and occasionally each individual school, has the freedom to make choices regarding scheduling, there is much research available that is influencing major scheduling decisions.

When the 1983 report *A Nation at Risk* was released, one of it's predominate concerns was the use of instructional time in the classroom (National Commission on Excellence in Education, 1983). Concerns voiced in the report led to the development of the National Education Commission on Time and Learning (1994) which suggested:

> Learning in America is a prisoner of time. For the past 150 years, American public schools have held time constant and let learning vary. The rule only rarely voiced is simple: learn what you can in the time that is available. It should surprise no one that some bright hard-working students do reasonably well. Everyone else – from the typical student to the dropout runs into trouble. Time is learning's warden. (p. 7)

Many schools refrain from making modifications to schedules that could improve not only the climate of the school but student academic achievement as well despite the fact that "a schedule can have an enormous impact on a school's instructional climate" (Canady & Rettig, 1999, p. 56).

According to Karweit (1999) only 38 percent of the average school day involves genuine scholastic activities. The other 62 percent of the school day is lost in class changes, lunch, roll taking, passing out homework, and other tasks that are non-academic in nature. The National Education Commission on Time and Learning (1994) made numerous recommendations about the use of instructional time, including the following: (a) schools should be reinvented around learning, not time; (b) schools should provide academic time by reclaiming the school day for academic instruction; and (c) state and local school boards should work with schools to revamp education so that time becomes a factor in support of learning, not a boundary marking its limits.

There are various school schedule designs being implemented across America. The traditional scheduling structure typically involves schools utilizing six to nine class periods in a day. Schools with the six-period structure will have classes between 50 to 60 minutes in length; nine-period schools will have classes of 42 minutes or less (Canady & Rettig, 1995) with the other structure types falling somewhere in the middle of these parameters.

The implications of these traditional scheduling frameworks are discussed in detail by Nichols (2000, April) as he compares students to adults in the business world. Students are in a situation where they work for six to nine different bosses, each with a different area of expertise and personality. In addition, they are expected to report to six to nine different locations throughout the day. Most adults would cringe at the thought of such a schedule, yet we expect students to adapt and succeed.

The concept of block scheduling was developed in response to demands for systemic change in high schools (Trenta & Newman, 2002). First introduced by Joseph

Carroll in his Copernican Plan (Carroll, 1994), block scheduling can be defined as the structuring of time to allow for at least part of the daily schedule to be organized into larger blocks of time (more than 60 minutes) to allow flexibility for a diversity of instructional activities (Cawelti, 1995). There are two predominate forms of block scheduling in use by secondary schools across the country: the alternate day or A/B block schedule and the 4 X 4 block plan (Strader, 2001). The A/B schedule typically has a four period day, with classes taught on alternate days throughout the entire school year. The end result is eight possible credits at the completion of the school year. The 4 X 4-block differs from A/B in that the same courses are taught daily with the course ending after one semester of study. Students on the 4 X 4-block schedule have four new courses at the beginning of second semester, with the end result being the same as A/B block, eight possible credits at the end of the school year.

*Statement of the Problem*

As a direct result of the implementation of the 1983 report, *A Nation at Risk*, there is increased awareness and interest in the use of academic instructional time. One factor directly affecting academic time is the type of scheduling model to which students are subjected. This study addressed the affect that 4 X 4 block scheduling had on the American College Test (ACT) composite scores of high school students in the Cheatham County, Tennessee School System.

*Purpose of the Study*

The purpose of this study was to determine if converting to a 4 X 4 block schedule from a traditional six period schedule during the 1995 school year had an impact on composite ACT scores of high school students in Cheatham County, Tennessee. Data analyses on the factors of gender, ethnicity, and school attended were also examined.

*Significance of the Study*

In February, 2006, the Cheatham County School Board proposed a change back to a traditional schedule format after eleven years on a 4 X 4 block schedule format. Although the change was not immediately approved by a vote of the board, they continue to research the pros and cons of block scheduling for a future vote. This study will provide valuable information about the effect changing to block scheduling had on composite ACT scores of high school students attending Cheatham County Schools. The results of this study have been made available to the local school board administration to assist them in determining effective scheduling formats to be used in the future of Cheatham County Schools.

*Research Questions*

This study investigated the following questions:

1. Is there a statistically significant difference between composite ACT scores of high school students in Cheatham County, prior to and post implementation of the 4 X 4 block schedule?
2. Is there a statistically significant difference in composite ACT scores prior to and post implementation of 4 x 4 block scheduling based on gender?

3. Is there a statistically significant difference in composite ACT scores of students in Cheatham County prior to and post implementation of 4 x 4 block scheduling based on ethnicity?

4. Is there a statistically significant difference in composite ACT scores of students in Cheatham County prior to and post implementation of 4 x 4 block scheduling based on high school attended?

*Null Hypotheses*

The following null hypotheses were examined:

1. There is no statistically significant difference between composite ACT scores of high school students in the Cheatham County School System after the implementation of the 4x4 block schedule as compared to ACT scores of students on the traditional schedule.

2. There is no statistically significant difference in composite ACT scores of high school students in the Cheatham County School System prior to and post block implementation based on gender.

3. There is no statistically significant difference in composite ACT scores of high school students in the Cheatham County School System prior to and post block implementation based on ethnicity.

4. There is no statistically significant difference in composite ACT scores of high school students in the Cheatham County School System prior to and post block implementation based on school attended.

*Limitations*

This study was subject to the following limitations:

1. This study was limited only to Cheatham County, Tennessee.
2. This study only investigated two years of ACT scores.
3. This study excluded students who did not have both a Tennessee Comprehensive Assessment Program (TCAP) total reading score and a composite ACT score.
4. This study excluded students who did not graduate in either 1995 or 1997 from a high school in Cheatham County, Tennessee.

*Assumptions*

For the purpose of this study, we assumed the following:

1. Students received instruction from highly qualified teachers.
2. All students put forth their genuine best effort on tests.
3. Testing conditions are appropriate and equivalent for all students.

*Definition of Terms*

4 X 4 block schedule: The practice of organizing the 180 day school year into two 90 day semesters. Each semester, students attend four 90 minute classes daily. Each course is completed and credit may be received at the end of the semester. Four different classes are taken the next semester, with eight credits possible for the year.

Traditional schedule: The most widely used form of scheduling in the United States. Students attend six to nine classes, for 45 to 60 minutes each, daily for the entire school year.

Composite ACT score: The average of the four test scores, rounded to the nearest whole number. Scores can range from 1 (lowest) to 36 (highest).

TCAP total reading score: The average of the tow reading scores on the Tennessee Comprehensive Assessment Program test, ranging from 1 (lowest) to 9 (highest).

# Chapter II

## Review of the Literature

### *Introduction*

This chapter examines the literature related to the history of block scheduling, problems with traditional scheduling, advantages and disadvantages of block scheduling, and finally, how block scheduling effects various types of standardized test scores. In this review are studies showing a correlation between block scheduling and increased test scores, as well as some studies showing no correlation between the two.

### *History of Block Scheduling*

Scheduling of classes in schools has been done since schools came into existence, likely even before. The most common schedule type currently in use is the traditional schedule in which students typically attend six classes for approximately 50 minutes per day (Canady & Rettig, 1995). This schedule type has predominately been the one in use across the country for decades. Schedules, like anything else, are likely to remain the same unless there is good reason for change. In the early 1960s, Joseph Carroll, assistant superintendent for research, budget, and legislation in the District of Columbia public school system, found students in summer school performed significantly better than they had during the regular school year. Scores on pre- and post-tests were studied by Carroll and the average student gains were equivalent to two years of regular coursework (Carroll, 1994). The success in summer school was attributed to longer periods of time spent in the classroom as well as the methods of teaching utilized in summer school. Carroll began the reform of school scheduling by urging schools to increase the blocks of

time during which students were receiving instruction. Unfortunately, his urging was met with much resistance and it was not until the early 1980s when Carroll introduced The Copernican Plan for educational reform that many educators began to take notice. According to Carroll (1994), The Copernican Plan proposed many changes, "...but the achievement of those changes—or any other of the many interesting changes proposed for our high schools—depends upon a fundamental change in the use of time" (p. 26). Classes under The Copernican Plan were taught in much longer periods of time with students being enrolled in fewer classes each day. Carroll employed an exemplary evaluation team from Harvard to objectively assess the effectiveness of The Copernican Plan after it was implemented in seven different high schools. The team utilized outcome-based evaluations that measured student conduct and academic success. According to Carroll the results consistently favored the Copernican structure "with results being statistically significant at consistently high levels of confidence" (p. 26).

In 1983, about the same time as Carroll introduced his Copernican Plan, the National Commission on Excellence in Education published its report *A Nation at Risk.* Since this publication, educational effectiveness has been continually questioned. Inefficient use of time in the classroom is something for which teachers and administrators have been persistently criticized (Lawrence & McPherson, 2000). According to the 1994 report by the National Education Commission on Time and Learning, "...learning in America is a prisoner of time" (p.7). Since learning is perceived to be such a prisoner, numerous changes in school scheduling were proposed; many of which significantly resembled Carroll's Copernican Plan.

In a 1995 study by Gordon Cawelti, a broad national picture of the restructuring movement in high schools and the innovation known as block scheduling was provided. According to Cawelti's study, 11 percent of high schools nationwide were utilizing block scheduling, 12 percent suggested that some sort of innovative scheduling was being implemented, and 15 percent had plans to implement some kind of varied schedule type for the upcoming school year. A total of 38 percent of all high schools surveyed were already implementing or planning to implement some form of schedule change within a year. It is apparent from this study that by the early 1990s, use of block scheduling was becoming more prevalent by high schools across the country.

*Problems with Traditional Schedules*

It is obvious if a scheduling reform was initiated, there must have been either real or perceived problems with existing schedule formats. According to Canady and Rettig (1995) those problems are numerous. Traditional schedules, they contend,

> ... (a) contribute to the impersonal nature of high schools; (b) exacerbate discipline problems; (c) result in a hectic and fragmented school day, especially when combined with increased graduation requirements; (d) limit instructional possibilities for teachers; (e) do not permit flexible time to meet individual students learning needs; and (f) do not result in "user-friendly" workplaces for staff (p. 18).

Carroll (1994) substantiates their claim of impersonal schools when he states "a kid can go several days without having a meaningful interaction with a teacher" (p. 106). When many teachers have over 150 students in their care each day, it is difficult to accomplish

menial tasks, let alone have positive one on one interaction with the majority of students. Many teachers and administrators, according to Canady and Rettig, felt:

> ...an impersonal environment was created by the assembly-line, single-period daily regimen and that student discipline was affected adversely by schedules that released thousands of students into hallways 6 to 10 times a day for three to five minutes of chaos. (p. 28)

Nichols (2000) asserts that time constraints placed on teachers under the traditional format prevent teachers from being as creative and innovative in the classroom as they could be if given more time. Nichols also contends that although lecture format is not the most effective teaching method, it is forced upon students due to the lack of time for more creative methods such as cooperative learning. This frustration with the traditional scheduling format was shared by Sharon Walker (1999), the principal of Queen Creek High School in Arizona, who stated,

> ...teachers really can't make content relevant to students in a 45-minute time period. The real world just doesn't work like that. High school students not only want to see relevancy in the work they are asked to do, but they also want to participate in the process of learning. They don't want to sit back and have it singularly delivered to them. (p. 44)

The diversity of course offerings is often much more limited on the traditional schedule than on block (Thomas, 2001). Typically schools on block schedules will be able to offer more electives and more advanced courses due to the increase in the number of possible credits available.

*Advantages of Block Scheduling*

Frustration with traditional scheduling formats might lead schools to look for solutions, but before making the change to block scheduling, administrators and other decision-makers nationwide wanted proof that this variation of schedule would be of benefit. This proof was easily found. While various studies reported advantages to the block schedule, only the most common benefits will be reviewed. The difference in the number of courses taken daily means fewer transitions between those courses for students. According to Canady and Rettig (1999), "reducing the number of transition periods nearly always has a positive effect on the school's disciplinary climate" (p.14). The decrease of these transitions is very unlikely in schools on the traditional schedule. In a study conducted by Strader (2001), 101 schools on block schedule were studied and teacher perceptions were gathered as well as data on the number and type of disciplinary referrals. Strader found hall disruptions and major and minor disciplinary issues decreased substantially on the block schedule. Additionally, Canady and Rettig state that students spend less time in highly congested areas such as hallways and dressing rooms, thus reducing discipline problems in those typical trouble areas.

While reducing discipline in the hallways is positive, is discipline in the classroom also positively affected by block scheduling? According to a 1997 study by Snyder, the answer is a definite yes. In his study, Snyder looked at Angola High School in Angola, Indiana, in great detail. Teachers at Angola High claim due to longer class periods and fewer students per class, conflicts were resolved more easily and expeditiously than on the traditional schedule. The total number of in school suspensions (ISS) was reduced from an average of 1.5 students per day to only one student per day

(Snyder, 1997). According to O'Neil (1995) principal Roger Schoenstein, whose school changed to block schedule in 1989, believes school-wide discipline was reduced due to "...a calmer place, fewer fights, less vandalism—just a slowed-down pace across the entire building" (p.14). Creamean and Horvath (2000) noted a decline in total number of discipline referrals, student suspensions, and total days of suspension after implementation of the block schedule at a suburban Midwestern high school.

Many studies, including Salvaterra and Adams (1998), Nichols (2000), and Canady and Rettig (1995, 1999), report an increase in student grade point averages (GPAs) after implementation of block scheduling. Also, in a study by Thomas (2001), 54% of Florida students on block schedules earned higher grade point averages than on traditional schedule. In addition to increased grade point averages, Nichols' study of six Midwest high schools on block scheduling also reported students received fewer failing grades after conversion to the block format. Trenta and Newman (2002) found a statistically significant positive relationship between block scheduling and student grades in each of the four academic subject areas, but no statistically significant relationship between block scheduling and student GPAs. Snyder's study found statistically significant increases in student's GPAs at the $p \leq .01$ level in every department with the exception of physical education which had a very small sample size. There were also 30 percent more A's after the implementation of the block schedule in Snyder's study. Canady and Rettig (1999) and Snyder (1997) report an increase in the total number of students on the honor roll after implementation of block scheduling as well an increase in the likelihood that at-risk students would remain enrolled through graduation.

Although difficult to measure, one benefit of block scheduling cited by several studies (Canady & Rettig, 1995, 1999; Carroll, 1994; Creamean & Horvath, 2000; Davis-Wiley, 1995; Nichols, 2000; Snyder, 1997) is lowered teacher and student stress levels. Davis-Wiley (1995) found teachers felt less stressed simply due to the reduced number of classes taught daily. Preparation time required for teaching was greatly reduced, thus reducing the amount of stress experienced. Teachers in the Davis-Wiley study also cited the lower number of overall students in their care as a factor in reducing stress levels. Similarly, students in Davis-Wiley's study felt less stress on the block schedule because their course load was reduced by nearly half. Students felt they could study more effectively when studying for only four subjects as opposed to six.

Attendance is a key area of concern for most administrators, parents, and teachers. It is hard to argue that students are unlikely to succeed in the classroom if they are not present. In a study conducted by Creamean and Horvath (2000), a notable increase in overall school attendance occurred in the two years following implementation of the block schedule; data beyond those two years were not available. Carroll (1994) also found increased attendance after he implemented his Copernican Plan. Carroll speculated that students did not experience the same burn-out when they were only attending a class for one semester. Snyder (1997) found a significant ($p \leq .05$) increase in attendance rates at Angola High School after the block schedule was implemented, with only the winter months seeing some negative change. Schoenstein (1995) also found an increase in average daily attendance at Wasson High School where the data show an increase from 91.7 to 93.9 percent after five years on the block schedule. Specific reasons students attend more frequently on the block schedule as opposed to traditional is a topic that is

not widely addressed although Carroll (1994) found students felt it was too difficult to recover from an absence on the block schedule.

A rarely mentioned but important advantage of block scheduling was addressed by Walker (1999) when she discussed textbooks and their cost. Money is saved on textbooks by the school systems utilizing the block schedule because fewer students are using them at one time. Canady and Rettig (2003) found teachers make better use of technology that is available to them in the classroom. Utilizing this technology not only makes the money spent on this equipment worthwhile, but also helps teachers engage students in more active learning activities.

Overwhelmingly, the most noted benefit of block scheduling seems to be the increase in positive relationships between teachers and students. Although the data supporting this claim are primarily anecdotal, they are consistent. Strader (2001) found that administrators and teachers at all levels of experience agreed that block scheduling positively impacted the teacher/student relationship. Teachers felt that their day was much less hectic on the block schedule and more time could be spent fostering positive relationships with students. Similarly, Davis-Wiley (1995) found block scheduling helps teachers to develop closer relationships with their students while providing additional opportunities for students to receive help from their teachers. Teachers surveyed in the Walker (1999) study affirmed they were overwhelmingly more satisfied with their relationship with students. Their satisfaction was dependent upon their class numbers, depth and frequency of interactions, and "...their ability to monitor and adjust their lessons to meet student needs" (Walker, 1999, p. 41). In a study conducted by Marshak (1998) in Washington State, it was determined that teachers on block schedule tend to

abandon their goal of covering curriculum and focus more on "the breadth and depth of student learning" (p. 56). When teachers take learning to a new level for students, positive interactions are inevitable. It is important to note that simply changing the length of time in class, without teachers adapting their teaching methods accordingly, is likely not going to produce positive results in the classroom (Canady & Rettig, 2003). The most successful teachers on the traditional schedule may not succeed on the block if they do not make the changes necessary to allow students the best possible use of time and resources. Queen, Algozzine, and Isenhour (1999) found that the most important skills necessary for teachers to adequately implement block scheduling were instructional pacing and utilizing a variety of instructional strategies. Another study with similar findings was done by Wyatt (1996) who stated "...block scheduling without fundamental changes in instruction is merely longer blocks of the same old stuff" (p. 16). With these changes teachers can provide a classroom environment in which students are better able to learn and have more opportunity for one on one interaction and feedback from their teacher.

*Disadvantages of the Block Schedule*

While the advantages seem to be numerous, there are also some disadvantages to block scheduling noted by researchers. Making a change of any kind is often viewed as negative, thus when many schools make the switch to block scheduling, it is perceived negatively. Teachers seem to be concerned about how the change will impact their lives. Salvaterra and Adams (1998) found teachers to be concerned with three main issues: (a) time will be taken away from family in order to prepare for longer class periods, (b) time will be taken away from leisure time in the summer due to training, and (c) the amount of

stress they would be under to adapt their teaching styles. It is interesting to note, none of the concerns mentioned are directly related to student success.

Thomas (2001) found that while advanced students do just as well on block as they did on traditional schedule, the same is not true for struggling students. The researcher states, "...those who struggle academically do much worse than similar students in traditionally scheduled schools" (p.75).

Students in blocked schools may not have the same access to equipment as their traditionally scheduled peers due to the occasional increase of class size in elective courses. Walker (1999) noted a disadvantage of availability of equipment in elective courses at her Arizona high school. Six students were forced to share one digital camera in a photography class, whereas on the traditional schedule, only three students shared the camera at any one time. Additional funding was not available to supply the needed equipment resulting in students, teachers and parents having a negative view of block scheduling for those courses.

The most commonly noted disadvantage of block scheduling is one that can be remedied: failure of teachers to change their practices when the block schedule is implemented. Marshak (1998) found many teachers continue to lecture or carry on teacher-centered activities during block schedules, instead of varying their methods to better utilize the additional time. Marshak also noted many teachers allowing "considerable chunks of class time to be used for 'hanging out' and homework" (p. 56). Similarly, Queen et al. (1999) found that administrators were concerned that many teachers who "would not or could not use more effective methods might lecture the entire 90 minutes or lecture for the traditional period of time and allow the remaining 30 or 40

minutes for students to do homework or do nothing" (p. 101). Many schools mandate training that focuses on these issues prior to implementation of block schedules.

*Testing on the Block Schedule*

With the emergence of high-stakes testing and the No Child Left Behind Act, test scores are being highly scrutinized by parents, teachers, administrators, and legislators. It is no surprise that test scores as they relate to the implementation of block scheduling have also been widely studied. Scores on the Advanced Placement (AP) exams given in a variety of subjects were studied by Canady and Rettig (1999) at Thomas Edison High School in the suburbs of Washington, D.C. An increase in the number of students scoring three or higher increased from 70 percent to 81 percent after the block schedule was implemented. However The College Board (1998) concluded students on block scheduling underperformed on the AP exams compared to their non-blocked peers. Teachers of AP courses at Angola High School cite the gap between the time the course is taken (typically in the fall semester) and the time the AP exams are given (late spring) as the likely cause for lowered scores (Snyder, 1997).

One possible solution to this gap in learning is to implement a modified form of the 4 X 4 block schedule. Many schools implement an A/B Block Schedule in which eight courses are taken for the entire school year; four on day A and the other four on day B with days alternating throughout the year (Williams, 1999). This type of schedule would allow students taking AP courses to be exposed to the content year round, and possibly be more prepared when AP exams are given in the spring (Snyder, 1997). Many schools also utilized the modified block schedule in which certain courses are scheduled on 4 X 4 block, while others are year round (Wronkovich, 1998). Wronkovich asserts,

"Alternative scheduling seems right for some curricular areas and wrong for others" (p. 4). Assessing which curricular areas may benefit from block scheduling and those which do not is a topic for local stakeholders to address as course offerings vary from school to school.

Because few states require the same types of tests of their students, it is difficult to adequately compare state mandated test scores. However, several studies did find differences within individual states on such tests. In New York, students in block scheduled schools had a lower passing rate on state exams than students in schools on a traditional schedule (Thomas, 2001). Conversely, Snyder (1997) found block scheduling positively impacted scores at Angola High School on the Indiana State Test of Educational Proficiency (ISTEP). Scores after implementation of the block schedule were "...higher than any other high school in north-eastern Indiana" (p.6) according to Snyder.

Lawrence and McPherson (2000) studied scores on the North Carolina End-of-Course Assessment which is a requirement for graduation in that state. Their findings indicated mean scores under the traditional schedule were significantly higher in Algebra 1, Biology, English 1, and U.S. History. Walker (1999) also noted a decrease in scores on newly mandated state tests in her Arizona high school. Although the drop was slight, it was of great concern to administrators and parents. Walker found literature suggesting that scores may decline due to essential core classes being completed in the fall semester and testing not occurring until the end of the spring semester. Scroth and Dixon (1996) studied scores of high and low achieving students, both on block and on traditional schedules, on the Texas Assessment of Academic Skills (TAAS). Scroth and Dixon found no statistically significant difference in scores of high or low achievers when on

block as compared to those students still on the traditional schedule. While many studies address state testing, few offered data that greatly support block scheduling over another schedule type.

Since state mandated tests are difficult to compare, many studies (Snyder, 1997; Strader, 2001; Trenta and Newman, 2002; Harmston, Pliska, Ziomek, & Hackmann, 2003; Hackmann, Hecht, Harmston, Pliska, & Ziomek, 2001; Canady & Rettig, 1999) look at scores on the more widely utilized American College Test (ACT) to determine the success or failure of modified scheduling. Although it is widely used, there are still drawbacks to studying ACT scores. Trenta and Newman (2002) contend that "since not all students take the ACT and those that do self-select, this creates potential for underlying variation in ability to cloud relationships with other factors such as time in block scheduling" (p. 61). After adjusting for variation in ability by holding IQ constant, Trenta and Newman found no statistically significant difference in ACT scores of students on block and those not on a block schedule.

In a large study of 38,089 high school seniors from 568 high schools in Illinois and Iowa, Hackmann et al. (2001) compared ACT scores of students on 4 X 4 block, A/B block, and traditional schedule, "The differences between schedule types on composite scores were negligible" (p. 10). Also of importance is the number of years of data utilized for the study. In a study conducted by Harmston et al. (2003), seven years of data were studied, including two prior to implementation of block and four post implementation. This study cited a slight decline in mean ACT scores of students on 4 X 4 block schedule; it also noted a slight upward trend in mean ACT scores of students on traditional schedule. Mean ACT scores of students on 4 X 4 block schedule were found to increase

slightly during the fourth year post implementation. Further data were not available to determine if that trend continued.

At Angola High School, Snyder (1997) found ACT scores that were significantly improved after implementing the 4 X 4 block schedule. The mean composite ACT rose from 21.1 to 22.3 after two years on the block, with gains also seen on each section of the test. This success was shared by Strader's (2001) study which showed a statistically significant increase in ACT scores while on the block schedule. It should be noted that Strader's study looked at two years of post implementation data, while Snyder's looked at four years of post implementation data.

It is complicated to draw any conclusions about the effects block scheduling may have on ACT scores due to the lack of consistent empirical data in the field. The studies available are difficult to compare due to vast differences in population sizes, time spent on block schedule, and years of data available.

*Summary*

Chapter II surveyed the literature addressing the history of block scheduling, problems with traditional schedules, advantages and disadvantages of block scheduling, and testing on the block schedule. While much research has been done on the effects various scheduling formats have on student achievement, the research is primarily inconclusive. More longitudinal studies of data, both prior to and post implementation of any schedule type are needed to draw definitive conclusions. Research has found the effectiveness of any scheduling format change is largely based on the way in which the change is implemented by the administration (Wyatt, 1996).

According to Strader (2001),

> ...any stimulus that allows teachers to expand their teaching methodologies, improves school climate, and/or positively affects the student/teacher relationship will, over time, improve instruction and consequently improve student achievement for a wider cross section of the student population (p. 40).

'Over time' is the key phrase in Strader's passage; student achievement is more deeply affected by a culmination of events over time. Block scheduling is not a fad that should be implemented and then disregarded without serious evaluation. Detailed empirical research should continue on schools that have implemented block scheduling so that significant trends can be identified and addressed.

# Chapter III

# Methodology

## *Introduction*

The purpose of this chapter is to explain the methods and procedures that were used to conduct this study on the effects of block scheduling on ACT scores. Included in this chapter are a description of the research design, participant information, data collection procedure, data analysis plan, and null hypotheses.

## *Research Design*

The purpose of this study was to compare the composite ACT scores of high school seniors in Cheatham County, Tennessee, prior to and post implementation of a 4 X 4 block schedule during the 1995 school year. The relationship between ACT scores prior to and post implementation of 4 X 4 block scheduling were examined for significance based on the following variables: (a) gender, (b) ethnicity, and (c) school attended.

## *Participant Selection*

Test data from all students who graduated in either 1995 (before block implementation) or 1997 (after block implementation) from either of the two public high schools existing in Cheatham County, Tennessee at the time were utilized for the study. In order to achieve matched groups of data, only the composite ACT scores of students who had an eighth grade TCAP total reading score of four, five, or six were utilized. Scores of four, five, or six on the TCAP fall exactly in the middle of the stanine score range and are considered average. Looking only at ACT scores of students with these

particular TCAP scores helped to ensure the groups of data are matched and appropriate for comparison.

*Data Collection Procedure*

Prior to collection of data, permission was granted for the study by the Austin Peay State University Institutional Review Board (see Appendix C) and Mrs. Lynn Seifert, Director of Cheatham County Schools (see Appendix B). Aggregated data for this study were provided by school personnel having the authority to do so and were gathered from the permanent school records located at each of the high schools in Cheatham County. TCAP scores were collected first, with only those of four, five, or six on the total reading portion being utilized. Next, ACT scores of the students who had TCAP scores in the stated range were retrieved from the permanent records. Records were coded without student names. Data were aggregated by gender, ethnicity, and school attended. Each of the two high schools in existence in Cheatham County during 1995 and 1997 was designated by a randomly assigned number.

*Data Analysis Plan*

STATView Statistical Software was utilized to conduct an un-paired t-test to compare ACT scores prior to and post 4 X 4 block schedule implementation in 1995. An Analysis of Variance (ANOVA) was used to test for statistical significance with regard to ethnicity, gender, and school attended. Because the p-value determined by the ANOVA for gender and school attended approached .3, a further discreet analysis of the data was run utilizing an unpaired t-test. The relationship of each analysis was determined at the .05 level of significance.

# Chapter IV

## Results and Analysis of Data

### *Introduction*

This study examined the effects block scheduling, a strategy implemented in Cheatham County Schools during the 1995-96 school year, had on ACT scores of high school seniors in Cheatham County, Tennessee. A total of 254 composite ACT scores were utilized for this study with 169 students attending Cheatham County Central High School and 85 students attending Harpeth High School. Table 1 details the total number of ACT scores analyzed from each school.

Table 1

*Total number of ACT Scores utilized*

| School | Scores in 1995 Before Block | Scores in 1997 After Block |
|---|---|---|
| CCCHS | 73 | 96 |
| HHS | 34 | 51 |
| Total Scores | 107 | 147 |

Using the STATView statistical software program, the ACT scores of seniors prior to the implementation of block schedule were compared to ACT scores of seniors after implementation of block schedule. Only ACT scores of students who had an eighth grade TCAP total reading score of four, five, or six were utilized for the study. Independent factors of gender, ethnicity and school attended were also researched. Three

hypotheses were analyzed using descriptive statistics. Hypotheses with two variables were analyzed using the unpaired t-test. The relationship of each analysis was computed at the .05 level of significance. Hypotheses with more than two variables were analyzed using an analysis of variance (ANOVA) also at the .05 level of significance.

## Presentation and Analysis of Data

*Research Question One*

The basic and fundamental question for the study stated, is there a statistically significant difference between composite ACT scores of high school students in Cheatham County, prior to and post implementation of the 4 X 4 block schedule?

As seen in Table 2, using an unpaired t-test to compare the composite ACT scores prior to and post implementation of the block schedule yielded a p-value of .0002 (alpha = .05). This indicates a statistically significant difference between mean scores prior to and post implementation of block scheduling. The mean score post implementation was 1.445 points higher than the mean score previous to implementation of the block schedule.

Table 2

*Unpaired t-Test for ACT composite scores*

| Variable | # of subjects | Standard Deviation | Mean | df | t | p |
|---|---|---|---|---|---|---|
| ACT Composite Before Block | 107 | 3.19 | 17.041 | 252 | 3.744 | .0002 |
| ACT Composite After Block | 147 | 2.81 | 18.486 | | | |

$\alpha$=.05

*Hypothesis One*

The null hypothesis stated there will be no statistically significant difference between composite ACT scores of high school students in the Cheatham County School System after the implementation of the 4x4 block schedule as compared to ACT scores of students on the traditional schedule. The p-value of .002 indicates there is a statistically significant difference in these two sets of ACT scores. The null hypothesis is therefore rejected and for the purpose of this study, it can be stated that composite ACT scores after implementation of block scheduling are significantly higher than composite ACT scores prior to the implementation of block scheduling.

*Research Question Two*

The second research question seeks to determine if there is a statistically significant difference in composite ACT scores prior to and post implementation of 4 X 4 block scheduling based on gender. First an Analysis of Variance (ANOVA) was utilized to compare the differences in mean scores of males and females before and after implementation. It was determined based on the p-value of .2458, as seen in Table 3, that there was no statistically significant difference in mean scores for males or females. This indicates block scheduling is not statistically more advantageous for males than for females and vice versa.

Table 3

*ANOVA Gender for ACT composite*

| Variable | # of subjects | Standard Deviation | Mean | df | F | p |
|---|---|---|---|---|---|---|
| Males Before | 51 | 2.929 | 17.117 | | | |
| Males After | 94 | 2.026 | 18.118 | | | |
| Females Before | 56 | 3.634 | 16.906 | 3 | 1.354 | .2458 |
| Females After | 53 | 3.35 | 18.821 | | | |

α=.05

Due to the p-value approaching the seventy percent confidence level, it was determined that further discreet analysis of the data may be beneficial and unpaired t-tests were utilized to compare scores for each gender individually. As seen in Table 4, when analyzed separately, females did score significantly higher after implementation than before, based upon a p-value of .0051. The mean score was nearly 2 points higher after implementation of block scheduling.

Table 4

*Unpaired t-Test for Females ACT composite Scores*

| Variable | # of subjects | Standard Deviation | Mean | df | t | p |
|---|---|---|---|---|---|---|
| Females ACT Before | 56 | 3.634 | 16.906 | 107 | 2.861 | .0051 |
| Females ACT After | 53 | 3.35 | 18.821 | | | |

α=.05

The same discreet analysis utilizing an unpaired t-test comparing males before and after implementation of block scheduling resulted in a p-value of .0051, also statistically significant, as seen in Table 5.

Table 5

*Unpaired t-Test for Males ACT Composite Scores*

| Variable | # of subjects | Standard Deviation | Mean | df | t | p |
|---|---|---|---|---|---|---|
| Males ACT Before | 51 | 2.929 | 17.117 | | | |
| Males ACT After | 94 | 2.026 | 18.118 | 143 | 2.172 | .0315 |

$\alpha$=.05

*Hypothesis Two*

The null hypothesis states there will be no statistically significant difference in composite ACT scores of high school students in the Cheatham County School System prior to and post implementation based on gender. Based upon the statistical analysis using the ANOVA which compared the difference in the means of males and females before and after implementation of block scheduling, the null hypothesis must be accepted. The p-value of .2458 using the ANOVA indicates there is no statistically significant difference in ACT scores with relation to gender. Block scheduling is found to be equally advantageous for both genders, with neither gender benefiting more significantly from the utilization of block scheduling.

When further discreet analysis of gender related data was conducted using an unpaired t-test a p-value of .0051 indicated females scored significantly higher after the

implementation of block scheduling, while a p-value of .0315 indicates the same for males.

*Research Question Three*

The third research question seeks to determine if there is a statistically significant difference in composite ACT scores of students in Cheatham County prior to and post implementation of 4 X 4 block scheduling based on ethnicity. Due to the small sample size of only eleven total ethnically diverse students, seven prior to implementation and four post implementation, it was not possible to determine with statistical significance if block scheduling impacted scores of ethnically diverse students. Therefore, research question number three was eliminated from the study.

*Research Question Four*

The last of four research questions seeks to determine if there is a statistically significant difference in composite ACT scores of students in Cheatham County prior to and post implementation of 4 X 4 block scheduling based on high school attended. To determine the answer to this question, an Analysis of Variance (ANOVA) was run to compare the differences in mean scores of each high school before and after block schedule implementation. Data, as seen in Table 6, show a p-value of .1108, which indicates neither school benefited statistically more from the strategy of block scheduling than the other. Both schools seemed to improve similarly after the implementation of block scheduling.

Table 6

*ANOVA both Schools' ACT Composite*

| Variable | # of subjects | Standard Deviation | Mean | df | F | p |
|---|---|---|---|---|---|---|
| CCCHS Before | 73 | 2.982 | 16.722 | | | |
| CCCHS After | 96 | 2.599 | 17.781 | | | |
| HHS Before | 34 | 3.509 | 17.660 | 3 | 2.561 | .1108 |
| HHS After | 51 | 2.686 | 20.000 | | | |

$\alpha$=.05

When further discreet analyses of the data were conducted utilizing an unpaired t-test comparing each individual school's scores before and after implementation, slight differences were noted. As seen in Table 7, scores at Cheatham County Central High School were significantly higher (p-value = .0166) after implementation of the block schedule.

Table 7

*Unpaired t-Test CCCHS ACT Composite*

| Variable | # of subjects | Standard Deviation | Mean | df | t | p |
|---|---|---|---|---|---|---|
| CCCHS ACT Before | 73 | 2.982 | 16.722 | 168 | 2.42 | .0166 |
| CCCHS ACT After | 96 | 2.599 | 17.781 | | | |

$\alpha$=.05

The same procedure was followed with scores from Harpeth High School (HHS) and it was determined that there was a statistically significant difference in composite

ACT scores before and after implementation of the block schedule, as seen in Table 8, with students scoring higher after implementation of the 4 X 4 block schedule.

Table 8

*Unpaired t-Test HHS ACT Composite*

| Variable | # of subjects | Standard Deviation | Mean | df | t | p |
|---|---|---|---|---|---|---|
| HHS ACT Before | 34 | 3.509 | 17.660 | | | |
| HHS ACT After | 51 | 2.686 | 20.000 | 84 | 3.287 | .0015 |

$\alpha$=.05

*Hypothesis Four*

The last hypothesis states there will be no statistically significant difference in composite ACT scores of high school students in Cheatham County School System prior to and post block implementation of 4 X 4 block schedule based on school attended. Based on the p-value of .1108 found using the ANOVA, the null hypothesis must be accepted as neither school benefited more significantly than the other after implementation of block scheduling.

# Chapter V

# Discussion

## *Summary*

The purpose of this study was to determine if converting to a 4 X 4 block schedule from a traditional six period schedule, during the 1995-96 school year, had an impact on composite ACT scores of high school students in Cheatham County, Tennessee. The relationship between ACT scores prior to and post implementation of 4 X 4 block scheduling was examined for significance based on the variables of gender, ethnicity, and school attended.

Block scheduling has been considered an attractive option for better utilization of time in high schools since the early 1990's (Canady & Rettig, 1999). Although utilized by approximately thirty percent of the nation's high schools (Nichols, 2000), the benefits of block scheduling are constantly an issue of debate. One benefit noted in studies by Snyder (1997), Strader (2001), and Hackmann et al. (2001) is an increase in ACT scores. Due to the wide use of the ACT as a college entrance exam and scholarship selection tool, schools and students would benefit from an increase in ACT scores. If utilizing block scheduling will facilitate a statistically significant increase in ACT scores, it should be something every school system considers.

Similar findings with regard to increase in ACT scores were reported by Harmston et al. (2003). In a comprehensive study including 450 schools in Illinois and Iowa that implemented some form of block scheduling, Harmston et al. (2003) found increases in ACT composite scores in the first two years post implementation in schools on the 4 X 4 block schedule. The most significant study found showing increased ACT

scores after implementation of 4 X 4 block scheduling was completed by Nichols (1997). In his study, Nichols (1997) found that at Angola High School in Indiana, ACT scores rose significantly with 4 X 4 block scheduling. Many other aspects of student achievement including: grade point average, Advanced Placement Test scores, and incidences of discipline were noted by Nichols (1997) as improving after block scheduling was implemented. Strader's (2001) study also noted significant increases in several aspects of student achievement including increase in mean composite ACT scores.

The sample for this study was 254 senior students attending one of two high schools in the Cheatham County School System in 1995 (prior to implementation) and 1997 (post implementation) who had both an eighth grade TCAP total reading score of four, five, or six and took the ACT. Utilizing the statistical software program STATView, unpaired t-tests and analysis of variance (ANOVA) were utilized to test for statistical significance. A total of three hypotheses were tested with an alpha at the .05 level of significance.

*Findings*

The purpose of this study was to determine if converting to a 4 X 4 block schedule from a traditional six period schedule, during the 1995-96 school year, had an impact on composite ACT scores of high school students in Cheatham County, Tennessee. The study found a significant increase in composite ACT scores after implementation of the 4 X 4 block schedule.

Hypothesis One: There is no statistically significant difference between composite ACT scores of high school students in Cheatham County, prior to and post implementation of the 4 X 4 block schedule.

This hypothesis was tested using an un-paired t-test at the .05 level of significance. The p-value of .002 indicates the difference between the scores is statistically significant and the null hypothesis was rejected. The mean ACT score rose from 17.041 before implementation to 18.486 after the block schedule was implemented.

Hypothesis Two: There is no statistically significant difference between composite ACT scores of high school students in Cheatham County, prior to and post implementation of the 4 X 4 block schedule based on gender.

Utilizing an analysis of variance (ANOVA) indicated the difference in mean scores was not statistically significant with regard to gender. The ANOVA indicated a p-value of .2458 which is not statistically significant; therefore the null hypothesis is accepted. The acceptance of the null hypothesis indicates implementation of the block schedule was not more advantageous for males than for females or vice versa; gender did not statistically impact ACT scores.

Further analyses were conducted to determine discreet differences between genders. Utilizing an unpaired t-test, scores of 56 females prior to implementation of the block schedule were compared with 53 females post implementation. Based on the p-value of .0051, it was determined that females did score significantly higher after the block schedule was implemented. The mean female score rose from 16.906 to 18.821. Scores of 51 males prior to implementation were compared to scores of 94 males post

implementation and a p-value of .0315 resulted. The male scores rose from a mean of 17.117 to 18.118.

Hypothesis Three: This hypothesis was eliminated from the study due to an inadequate number of ethnically diverse students to determine statistical significance with regard to ethnicity.

Hypothesis Four: The last hypothesis states there will be no statistically significant difference between composite ACT scores of high school students in Cheatham County, prior to and post implementation of the 4 X 4 block schedule based on school attended.

Utilizing an analysis of variance (ANOVA), comparing mean differences of both schools prior to and post implementation, the p-value of .1108 is not statistically significant. The null hypothesis was accepted as it could not be determined with statistical certainty that the school attended had an impact on ACT scores.

Further analysis was done by utilizing an unpaired t-test comparing scores of 73 Cheatham County Central High School (CCCHS) students prior to implementation of block scheduling to 96 scores of CCCHS students post implementation. The t-test resulted in a p-value of .0166 which indicates a statistically significant difference in scores post implementation. The mean score of CCCHS students rose from 16.722 to 17.781. Utilizing the same test comparing scores of 34 Harpeth High School (HHS) students prior to implementation to 51 HHS students post implementation resulted in a p-value of .0015, also indicating a statistically significant difference post implementation of the 4 X 4 block schedule. The mean score of HHS students went from 17.660 to 20.000 after implementation of the block schedule.

## *Conclusions*

The purpose of this study was to determine if converting to a 4 X 4 block schedule from a traditional six period schedule, during the 1995-96 school year, had an impact on composite ACT scores of high school students in Cheatham County, Tennessee. The study examined composite ACT scores of 254 Cheatham County seniors from 1995 and 1997, the years prior to and post implementation of the 4 X 4 block schedule in 1996. Based on the findings of this study, the following conclusions were made:

1. Composite ACT scores were determined to be significantly higher after the implementation of the block schedule in the Cheatham County School System in 1996. The mean composite ACT score rose from 17.041 to 18.486 suggesting that implementation of the block schedule did positively impact ACT scores.

2. Gender was not found to have a statistically significant impact on composite ACT scores. This indicates both males and females scored similarly before and after implementation of the block schedule. However, when analyzed separately, each gender scored significantly higher after the implementation of block scheduling with females having the largest gain in scores.

3. School attended was not found to have a statistically significant impact on composite ACT scores after the implementation of block scheduling. However, each individual school did score significantly higher after implementation of block scheduling, with Harpeth High School making the largest gain.

The following recommendations are made based upon the findings of this study:

1. Schools and School Systems should continue to research the effects block scheduling may have on all areas of student achievement, change can mean the difference between success and failure for some students.

2. Teachers who teach on the block schedule should use research based strategies aimed at increasing student achievement in order to make best use of classroom time.

3. School administrators should be allowed to make their own decisions regarding what scheduling type is best suited to the needs of their students.

*Future Research*

1. This study presented a limited amount of data regarding the effects of 4 X 4 block scheduling in a rural community in Tennessee. Two years of data were examined, one year prior to the implementation of block scheduling and one year post implementation of block scheduling. In order to be more effective at determining the true effects block scheduling may have on composite ACT scores this study should be replicated over a much longer period of time.

2. Composite ACT scores were the only scores utilized in this study. It may be more beneficial to disaggregate the composite scores into their respective disciplines of math, science, English and reading. This will enable the researcher to better determine the degree to which block scheduling impacts each of these disciplines.

3. In order to better determine the impact ethnicity may have on ACT scores after implementation of block scheduling, a more diverse sample of students should be selected for future research.

4. The year in which students initially take the ACT should be considered in future studies. Students often take the ACT multiple times; this study did not take this factor into consideration, but instead utilized only the most recent ACT score.

5. The number of semesters of instruction received on block scheduling prior to taking the ACT should be a factor considered in future studies. This study did not disaggregate data based upon the number of semesters of instruction received.

6. Due to the small size of the county studied as well as each school involved in this study, it would be beneficial to replicate the study utilizing a larger county with more schools to compare.

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# APPENDICES

# APPENDIX A

## Letter of Request to School System

# Cheatham County Central High School

ADMINISTRATION
Cheryl Richardson
Principal

Shannon Bryant
Assistant Principal

One Cub Circle
Ashland City, Tennessee 37
Phone (615) 792-5641
Fax (615) 792-2090

March 6, 2006

Dear Director Seifert:

As you may know, I am currently enrolled in the Graduate School at Austin Peay State University completing requirements for an Education Specialist degree. The final step toward this degree is to complete and submit a field study to my graduate committee. The topic I have chosen is a timely one for Cheatham County. Currently, I am planning to research the effects of 4x4 block scheduling on ACT scores in our county. In order to do this effectively, I will need to have access to several pieces of information. Obviously, I will need to look at ACT scores prior to and after the implementation of the block schedule. In addition, to assure matched groups of data, I will need to look at eighth grade TCAP scores. I would like to formally request permission to locate and utilize this information. I assure you that any data collected that will identify students in any way will be destroyed immediately after I am able to compile my data in a useable format. There will be no identifying information in the final product whatsoever.

Although my study may not be completed prior to the board's decision regarding scheduling for next school year, I believe this information could still be of great value to you and the school board. Once my entire field study is completed and approved by my graduate committee, I will be happy to provide you with a bound copy.

If you need more specific information on my study prior to making your decision, please let me know, I will be happy to meet at your convenience. Thank you for your time and attention to this matter.

Respectfully,

Shannon Bryant

# APPENDIX B

## Approval from School System

CHEATHAM COUNTY
Board of Education
102 Elizabeth Street
Ashland City, Tennessee 37015

Director of Schools
Lynn E. Seifert
Phone: (615) 792-5664
Fax: (615) 792-2551

March 13, 2006

Mrs. Shannon Bryant
301 Ridgeland Drive
Clarksville, TN 37043

Dear Mrs. Bryant,

I appreciate your interest in our ACT scores and readily grant you access to any scores that might help in your research. I, too, contacted ACT trying to get our pre and post block scores. Unfortunately, I was told that ACT does not encourage the comparisons of scores from year to year. They felt there were too many variables within a school year to allow an honest comparison. Please keep in mind that these are their thoughts, not mine. I will point out that several years ago the ACT was used as an exit exam. This caused many uninterested students to take the ACT which, in turn, caused our scores to fall.

Which ever way you decide to go, I wish you much good fortunate as you endeavor to complete your Education Specialist degree. If I can be of assistance to you, please do not hesitate to ask.

Yours in education,

Lynn E. Seifert

Lynn E. Seifert
Director
Cheatham County Schools

# APPENDIX C

## Approval from Institutional Review Board

Austin Peay
State University
College of Graduate Studies

June 15, 2006

Shannon Bryant
301 Ridgeland Drive
Clarksville, TN 37043

RE: Your application regarding study number 06-024: The Effects of 4X4 Block Scheduling on Composite ACT Scores in Cheatham County, Tennessee

Dear Shannon Bryant,

Thank you for your recent submission. We appreciate your cooperation with the human research review process. I have reviewed your request for expedited approval of the new study listed above. This type of study qualifies for expedited review under FDA and NIH (Office for Protection from Research Risks) regulations.

Congratulations! This is to confirm that I have approved your application through one calendar year. This approval is subject to APSU Policies and Procedures governing human subject research.

You are granted permission to conduct your study as described in your application effective immediately. The study is subject to continuing review on or before June 15, 2007, unless closed before that date. Enclosed pleas find the forms to report when your study has been completed and the form to request an annual review of a continuing study. Please submit the appropriate form prior to June 15, 2007.

Please note that any changes to the study as approved must be promptly reported and approved. If you have an questions or require further information, contact me at (221-7415; fax 221-7641; email pinderc@apsu.edu). Again, thank you for your cooperation with the APSU IRB and the human research review process. Best wishe for a successful study!

Sincerely,

Charles A. Pinder

Charles A. Pinder, Ph.D.
Chair, Austin Peay Institutional Review Board
cc: Dr. Carlette Hardin

# VITA

Shannon Salyer Bryant was born in Kansas City, Missouri, November 20, 1969. She grew up in Clarksville, Tennessee and attended school in the Clarksville Montgomery County School System. In 1988 Shannon began as a freshman at Austin Peay State University and completed a Bachelor of Science in biology in May of 1992. Her Master of Arts in Education, with emphasis in administration and supervision, was completed in December 1993 at Austin Peay State University. After teaching for seven years, Shannon moved into administration as an assistant principal at Cheatham County Central High School and remained there four years. She is currently assistant principal at Montgomery Central Middle and High Schools and will complete her Education Specialist degree, with emphasis in administration and supervision, in May of 2007 from Austin Peay State University.