IMPLICATIONS OF THE 4 X 4 BLOCK SCHEDULE ON HIGH SCHOOL STUDENTS

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To the Graduate Council

I am submitting herewith a field study written by Jeffrey Taylor Phillips entitled "Implications of the 4 x 4 Block Schedule on High School Students." I have examined the final copy of this field study for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Education Specialist, with a major in Secondary Education.

Ann Harris

Dr. Ann Harris, Major Professor

We have read this field study
and recommend its acceptance

Accepted for the Council

Dean of The Graduate School

IMPLICATIONS OF THE 4 X 4 BLOCK SCHEDULE ON HIGH SCHOOL STUDENTS

A Field Study

Presented for the

Education Specialist

Degree

Austin Peay State University

Jeffrey Taylor Phillips

April, 1999

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Signature Jeffrey T. Phillips

Date May 7, 1999

DEDICATION

This field study is dedicated to my parents

and

my students

who have allowed me the opportunity

to further my education.

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Abstract

This field study attempted to determine the implications of the 4 x 4 block scheduling format on high school students in a particular school system. The Average Daily Attendance records (ADA) and standardized test scores (ACT and SAT) for a four year period were investigated. A self-generated survey instrument was given to teachers who had taught under both a traditional six-period day and the 4 x 4 block schedule. This survey contained questions which related to the system's originally stated goals for implementing the scheduling change. The ADA records revealed no significant effect on attendance patterns after switching to the block schedule. A review of standardized tests revealed that the 4 x 4 block schedule has had no significant effect on ACT or SAT scores. The teacher surveys revealed that most teachers who responded preferred to teach under the 4 x 4 block and felt that it is beneficial to the majority of students.

It was concluded that since the 4 x 4 block schedule has had many positive effects on the school climate, but no significant impact on either attendance or academic performance, it is not the most effective method for all teachers, students, or subjects. Scheduling changes in education reform should be reflective of student goals and learning and not "clock hours" of time.

TABLE OF CONTENTS

LIST OF TABLES

Chapter 1

Problem Statement

Problem

The 4 x 4 block schedule format has been implemented in several school systems across the nation. In a selected school system with a diverse student population which has used the 4 x 4 block schedule format for a three year period, scores on standardized tests have shown no significant increase and have actually decreased in some areas. Student attendance has also seen a slight decline during this period. Originally, the stated reasons for implementing the block schedule format were: (a) to provide an alternative for electives due to the increasing graduation requirements, (b) to improve school discipline, (c) to allow students to focus on a more limited number of courses, (d) to allow for different teaching techniques within the reorganized time structure, (e) to allow for time to complete labs and class projects in one class period, (f) to spend less time starting and stopping classes, and (g) to allow

students to make up failed work during the regular school year (Hubbard & Noffsinger, 1995). After three years of using the 4 x 4 block scheduling format, the school system should investigate test score information and attitude surveys to determine if the original goals have been achieved and if overall student academic performance has had any significant change.

Importance of The Problem

Many school systems throughout the region and nation have embraced a system of student time management known as *block scheduling*. Block scheduling actually encompasses many different forms, among them the *4 x 4 block* which is used in the school system studied in this document. Using this format, students enroll in four 90 minute classes each term of their high school career (with two terms per academic year). Students take eight classes per year and may earn up to 32 credits (also referred to as *Carnegie units*) toward graduation over a four-year period. This is in contrast to a traditional six-period day in which students enroll in up to six classes per academic year (for 55 minutes each) and earn up to 24 credits toward graduation over a four-year period.

The change in the format of scheduling from a traditional six-period day to the 4 x 4 block schedule was met with some resistance from the community and was only partially embraced by the high school faculties in the school system under study. After three years, an investigation should be undertaken to determine if this format of scheduling has had any effect on the academic performance of students involved in the school system. The school system should also evaluate its original goals in implementing the scheduling change to determine if there has been any significant impact on the operation of the schools.

If there has been no effect on student achievement and if the average daily attendance has had a measurable decline, the school system should reevaluate the use of the 4 x 4 block schedule and should possibly consider either using a *modified* block or returning to a traditional six-period day.

Relationship of Field Study to Problem

To begin developing an understanding of the effects of block scheduling on high school students involved in this evaluation, a study of standardized test score results (Scholastic Achievement Test, American College Test), average daily attendance records and surveys of teacher attitudes from the six high schools in the school system should be undertaken. The diversity of schools in this school system may lend itself to some generalities that can be made to school systems in a variety of settings (this school system includes six high schools ranging in population from 600 students to 1700 students and including both rural and suburban populations within varying economic and ethnic backgrounds). Other school systems considering the 4 x 4 block schedule may benefit from this information and may be able to use it when making their own decisions. The studied school system also may be able to use this study to determine the effectiveness of the 4 x 4 block scheduling format on their own students and schools.

Preview

To reach the goal of understanding the impact of block scheduling on the high school students in the studied school system both objective and qualitative data was used. A study of standardized test scores (ACT, SAT) indicated any significant changes in the achievement levels of the student population. Average daily attendance records were used to indicate if the student

population is showing improvement with regard to attendance patterns. Surveys of faculty attitudes also indicated perceptions of the effectiveness of block scheduling and the achievement of the school system's original goals for implementing this format.

When the materials and information are gathered for this study, they will be used by the school system's Board of Education to determine if the change to the 4 x 4 block scheduling format in 1996 has made any significant impact on high school students. Other school systems may also use this information to determine if they should pursue a system-wide modification of the time management of students and teachers and if they should implement a 4 x 4 block schedule.

Research Questions

The following are questions which will be investigated during this study:

1. What are the implications of the 4 x 4 block scheduling format on the high school students of the studied school system?
2. Have the original goals for changing to the 4 x 4 block schedule format been achieved by the school system?

Hypothesis

An analysis of test score data, attendance records, and teacher surveys will show that the implementation of the 4 x 4 block schedule will produce no significant differences in the academic achievement of students.

This study will discuss the implications made by the implementation of the 4 x 4 block schedule on the high school students in the studied school system.

Definition of Terms

The following terms are used throughout this research:

1. 4 x 4 block schedule: a system of student scheduling in which students take eight different classes per year with four classes each term. Classes are typically 90 minutes in length. This allows students to earn up to 32 credits during a four-year high school career and is often referred to as a *semester* schedule.
2. Modified block schedule: a variety of alterations on the basic 4 x 4 block plan. This may consist of an A/B alternating day schedule in which students take four classes one day and four different classes the next day for an entire year (still completing eight classes in a year), or a schedule consisting of both 90 minute classes along with other classes which meet for 45 or 50 minutes.
3. Traditional six-period day: system of scheduling in which students take six different classes for an entire academic year. Classes are typically 50-55 minutes in length. Students may earn up to 24 credits toward graduation in a four-year high school career.
4. Average daily attendance: also known as *ADA*. this is a measurement of the average school and school system attendance records used by schools and school systems throughout the state.
5. Term: two terms exist during an academic year. These are approximately 90 days each. Under a traditional six-period day, a term was referred to as a semester.

6. Academic year: a school calendar year comprised of two terms or semesters (usually one in the fall from August until December and one in the spring from January until May).
7. Carnegie unit: a certification of the completion of a course of study. These units may also be referred to as *credits*.

Assumptions

The following has been assumed for this research:

1. The dependent variables were scored in a consistent manner.
2. Teachers and students participating in the surveys gave their honest and candid opinions.
3. Administrators distributed the surveys in accordance with the instructions.

Limitations

This study was limited to a representative population of high school students and teachers. Students at various high school grade levels have been instructed using the 4 x 4 block scheduling format for one to three years and may not have been taught under any other type of scheduling system. Teachers teaching within the 4 x 4 block represent a wide range of disciplines and years of expertise. Some data from test scores may reflect individual teaching and learning differences rather than that of any specific scheduling method. Many of the purported changes in the daily educational processes cannot be specifically linked to the 4 x 4 block schedule.

Summary

Much has recently been written on the subject of block scheduling. A study of the current literature including statistical data and opinion surveys from various sources throughout the country will show the similarities and differences of the studied school system's population to that of the rest of the United States

Chapter 2

Literature Review

Preview

Current research concerning block scheduling includes comparisons of national and local test scores, attitude surveys of students, teachers, administrators and community members, comparisons of financial considerations, and the personal opinions of prominent researchers in the field of education. The various studies, articles, books, and materials reflect many different opinions on the subject of block scheduling and student time management.

Background

History and development of block scheduling. Scheduling is seen as a resource that controls the utilization of people, space, time, and resources in an organization. A schedule can also have a great impact on the way instruction is delivered in the classroom and can thus facilitate the institutionalization of programs and desired practices.

The rationale behind changing schedules involves investigating the goals of block scheduling. According to Mistretta and Polansky (1997), their research from the East Lyme High School (Connecticut) indicates common goals to be: (a) reduce the number of class changes and transitions during any one school day, (b) reduce duplication and inefficiency, (c) reduce the number of students seen by each teacher daily, (d) reduce the number of courses for which a teacher must prepare daily, (e) reduce fragmentation, (f) provide flexible instructional environments, and (g) allow for variation of time based on content area. This list of goals is typical of those stated by other school systems throughout the nation.

In their report on block scheduling in Tennessee schools, Dennie Smith and Mary J. McNelis (1999) reported that one of the primary reasons cited for adopting the 4 x 4 block schedule was the State of Tennessee's mandated increase in high school graduation requirements. This increase in requirements and the resulting decrease in the number of electives have made the 4 x 4 block schedule seem to be a promising solution. Administrators also reported that educators, students and communities are demanding more electives to prepare students for futures in the rapidly changing technological world.

Block scheduling is not new in its concept. J. Lloyd Trump developed basic modular scheduling (known as the Trump Plan) in 1959. This has been expanded by educators such as Canady and Rettig. With increasing graduation requirements and higher state standards, block scheduling is seen by some to offer solutions to many of today's education problems. Some have chosen block scheduling as a way to hopefully change teaching methods and increase

active student learning and achievement, thus leading to success in formal education and the workplace (Canady & Rettig, 1995).

Advantages and rationales for block scheduling. Authors such as Dr. Robert Canady have cited several basic advantages to block scheduling. These deal with school climate, teaching, and assessment (Canady & Rettig, 1995). Canady and Rettig refer to block scheduling as a "catalyst for change" and several educators promote block scheduling as a type of plan to more closely align the classroom with the post secondary world (Edwards, 1995).

Some of the purported benefits of block scheduling, according to Canady and Rettig (1995) are the following:

1. The length of class periods is increased.
2. Teachers are able to use a variety of instructional approaches.
3. The number of class changes decreases.
4. Block scheduling saves time.
5. The number of preparations for teachers is reduced.
6. The opportunity is provided for interdisciplinary teaching.
7. The number of students taught each day by a teacher is reduced.
8. Planning time for teachers is increased.
9. Teachers are able to develop closer relationships with their students.
10. Opportunities are provided for project work.
11. Additional opportunities for teachers to help students are available.

Canady and Rettig (1993) indicate that block scheduling also offers the following advantages: (a) discipline problems are reduced, (b) possibilities for

acceleration are provided, and (c) students can repeat a failed course during the regular school year.

In addition to these reasons, an evaluation report of the Governor Thomas Johnson High School (Maryland) stated that block scheduling provides the opportunity for students to take one additional class per year, or four additional classes during their high school career. It was hypothesized from this report that these benefits lead to higher achievement and more positive student attitudes and a higher morale among teachers (Guskey & Kifer, 1994).

A survey conducted by the Virginia Department of Education indicated that a more relaxed environment was created by block scheduling and the unsupervised movement within schools was reduced, thus reducing the overall discipline problems. The change in the school schedule with a reduction in external interruptions, such as class changes, is believed to have a positive effect on the day to day climate of a school (Shortt & Thayer, 1999).

Actual surveys from studies among North Carolina high school students and teachers reveal that these purported advantages are touted by those using the block scheduling strategy. Teachers report that they like having fewer students, enjoy more planning time with fewer class preparations and a more relaxed overall daily schedule. Teachers also report having the opportunity to enrich their existing programs and use more "hands-on" type activities (Hurley, 1997). There is one specific distinction, however, that the majority of teachers who were utilizing more skill development techniques and activities did not teach classes requiring a state-mandated, standardized, end-of-course test (Hurley, 1997). Similar findings were revealed in the Governor Thomas Johnson evaluation of block scheduling (Guskey & Kifer, 1994). Teachers indicated the school climate improved with less class changes resulting in fewer

disruptions. With students spending more time in fewer classes, teachers reported that the overall quality of work from students on projects and reports was better.

With fewer students, fewer texts and materials are needed, thereby actually reducing operating costs. Having fewer students per day for each teacher is also seen as an advantage, allowing teachers to get to know students better. Teachers also have more time for collaboration with their colleagues and both students and teacher avoid the "mid-year slump" by changing schedules in January (Guskey & Kifer, 1994).

Students involved in the North Carolina surveys indicated their perceived advantages to block scheduling were better grades, more time for in-depth study, more individual attention from teachers, less hectic schedules, and the ability to "start over" each term. Students from the Governor Thomas Johnson school evaluation also report the ability to take more classes and have more options within a program (Guskey & Kifer, 1994). This allows for greater diversity in a program and permits students to take more elective courses. Longer periods allow for more extensive interactions between students and teachers and more opportunities for class discussions. Projects and homework are also mentioned as easier to manage due to the fewer number of subjects in which to prepare. In an article by Chuck Watson (1998) of James Madison University, he asserts that through careful planning, the extended class lengths provided by block scheduling can allow students to spend time searching the internet, reading and gathering materials for projects and assignments, designing and making products reflecting their learning, interviewing individuals, and writing projects.

Disadvantages and rationales against block scheduling. With careful planning and study of block scheduling before implementation, the concept is still met with skepticism and criticism by many in the field of education. Even in Virginia, where block schedules are popular, most studies conclude that more observational and anecdotal information exists than student performance data (National Council of Teachers of Mathematics, 1996). The findings raise some concerns from students, teachers, and others in professional education and the communities at large.

In general, the scheduling of classes becomes more complex due to the fact that most scheduling and reporting software programs are not usually designed for block schedules. Balancing student schedules is initially difficult and many times results in students taking all required subjects during the first term of a year, and all electives during the second term. The increase in demand for elective classes may also require more teaching personnel and this will increase the need to balance teachers' schedules to accommodate planning time and the availability to teach (Smith & NcNelis, 1996).

In the Governor Thomas Johnson High School evaluation report, students reported disadvantages that include:

1. There is a lack of diversity in class activities by some teachers. Students cited that some teachers simply do the "same boring things longer."
2. Adequate counseling in helping students balance the difficulty of their courses across semesters is a problem.
3. Ill-prepared substitute teachers are confused and uncertain how to handle a 90-minute class.

4. Students expressed concern about taking an AP course during the Fall semester when AP testing does not occur until Spring (Guskey & Kifer, 1994).

Students in the North Carolina studies mentioned that the primary disadvantage is that classes are sometimes too long (Hurley, 1997). Many of the teachers were reported to have lectured for most of the 90-minute periods. Several students also expressed frustration when teachers attempted to cover too much material in a short period of time. These were usually courses in which students were required to take standardized, state mandated exams at the end of the year. Several students also mentioned that absences were more difficult to deal with, since under the 4 x 4 schedule, one absence was the equivalent of two absences under a traditional six period day. Another disadvantage mentioned by students was that of early graduation. This occurs when a student completes all of the state mandated minimum requirements for graduation after the fall term and graduates in what would traditionally be the spring of their Senior year. This makes graduates ineligible to participate in spring sports and other activities their senior year.

Some of the disadvantages, according to teachers, seem to directly contradict the advantages. For example, most teachers report giving less homework under a block schedule, which is seen as an advantage to students. According to Sizer (1984), this is a clear case of a trade in which students and teachers have developed an agreement whereby teachers agree to give less homework if students agree to cooperate during class time!

Other disadvantages reported from teachers include:

1. The traditional curriculum and course textbooks in many subjects are not designed for 90-minute classes.

2. More supplies and equipment are required for the longer work periods and the diversity of class activities. This results in a direct increase in costs.

3. The short time between semesters makes the transition difficult for teachers and students to adjust and prepare for the new classes.

4. Scheduling of Advanced Placement course is a shared concern of both students and teachers.

5. New formats compel teachers to teach differently. This requires teachers to receive additional training and ideas on how to teach effectively in a 90-minute class.

6. Transfer students from schools on a traditional six-period day experience serious scheduling difficulties coming into schools on a block schedule (Guskey & Kifer, 1994).

The compressing of a year's worth of instruction into one term is a concern of both students and teachers. According to a news bulletin from the National Council of Teachers of Mathematics (1996), many teachers fear that under block scheduling, students actually learn less. These teachers stress that students have less instructional time for each course when schools replace two 50-minute periods with one 90-minute period. They argue that students can't pay attention for that long of a time period, especially when a teacher lectures for the entire class. As previously stated, some reviews of block schedules reveal that students do less homework and thus tend to cover less material per course.

Some educators express concern over students' ability to retain information when the gap between sequential courses, such as mathematics

and foreign languages, may be more than a year. Observers of many Canadian schools which have been expanding their use of block schedules since the 1970s, report that the mathematics achievement scores are showing an emerging downward trend in students who follow block schedules. The North Carolina Studies also report that block scheduling was least useful and interesting in mathematics (National Council of Teachers of Mathematics, 1996). In examining the effect of block scheduling on Advanced Placement classes, the College Board reported that more studies are needed, but that AP teachers, coordinators, readers, and test development committee members overwhelmingly oppose both semester block scheduling and January AP exams. Evidence does show, however, that students who completed year-long courses offered only in the fall or only in the spring tended to perform poorly on AP examinations in 1995 and 1996. In calculus, history, and the sciences, mean grades for block scheduled students were 0.6 lower (about half a standard deviation) than the mean for students who took the course over the full year. A study by Gordan Gore (1996) on 12th grade students in British Columbia actually showed diminished performance in all subjects for students on block scheduling. There may not yet have been sufficient controlled studies to lead to enthusiastic support for block scheduling. As indicated by the College Board, serious work remains before the supposed benefits of block scheduling can be assumed to be correct (Wronkovick, 1997).

When addressing the issues raised by block scheduling, several philosophical questions must be considered including: What is the position of the school and community regarding: (a) homework in vocational, academic and enrichment subjects, (b) the need for teachers to cover material that may be on end-of-course tests, (c) course enrichment activities, (d) the purpose of the

high school senior year, and (e) the purpose of co-curricular activities? Even though these issues are rarely discussed in schools using a traditional six-period schedule, the consideration and evaluation of a block schedule provide a unique opportunity to address these important questions.

Other scheduling considerations. With the implementation of block scheduling, there are a number of issues that should be addressed involving staff preparation and teacher training. In his article on scheduling, Monroe Brett (1996) asserted that longer class periods should be approached and planned in a completely different manner than a more traditional schedule. Some issues that must also be addressed in advance before implementation are:

1. In many courses, each level of instruction is built on the content of the material that should have mastered in previous levels. With the added time in each class session, teachers must teach for content by concept instead of content by chapter (Shortt & Thayer, 1997).
2. Sequenced courses (those such as foreign languages and some AP courses) should be taught in a timely manner that provides opportunities for student success. It is essential that these be taught in a manner and proximity that allows students the chance to utilize prior knowledge from previous courses. One possible problem is that of scheduling foreign languages. If these courses are taught back-to-back and are offered in the first and second year of high school, a student will have the opportunity to enroll in more levels of the same language or in additional languages. If a student is planning to enroll in a college or university that requires a foreign language as a graduation

requirement, the two-year gap between the 10th grade class and any post secondary classes could prove detrimental (Shortt &Thayer, 1997).

3. Schools increasing the numbers of class offerings may find that additional staff members are necessary. If factors such as teacher-student ratio and class load are to remain constant, the chances of an increase in required funds is likely.

4. Performing arts teachers and parents express concerns about limiting instruction in these areas to only one semester per year. When students choose to change courses at a semesters end, these obviously have an impact on the quality of these classes and organizations. There is also the fact that many students (and their parents) do not wish to dedicate one-fourth of their high school career to one particular class or performing organization.

5. Decisions concerning end-of-the year tests and Advanced Placement tests must be considered when planning a block schedule. Also, within a classroom, if time is set aside for review, less time will actually be available for instruction to prepare students for the next level. Students on a 4 x 4 block schedule, however, may need considerably more review if they completed the course material prior to the previous semester. Instructional time must be maximized to cover any curriculum mandates.

6. Students report that one of the reasons they enjoy block scheduling is that they have less homework (Hurley, 1997). This issue is of particular importance to the successful implementation of a 4 x 4 block schedule because, with fewer hours in class,

teachers need to be concerned with the demands and rigor of the course. If students report that they have less homework and spend less hours in class, how can a 4 x 4 block schedule be defended against those who argue that more time is needed in more difficult classes with more homework?

Problems unique to performing arts classes. Several unique problems concerning performing arts classes, and music classes specifically, have been the subject of much research. Since it is preferred by music educators to utilize full year curricular schedules in order to keep performing ensembles intact, this results in two credits per year, or twenty-five percent of a students' classes being in a performing ensemble over four years of high school (Blocher & Miles, 1996). This is a major concern to parents, teachers, administrators, and students, and may actually serve to prevent some students from enrolling in more than one performing or visual arts class during a single year.

Under 4 x 4 block schedules, there may be the wholesale turnover of students in a performing ensemble each semester. Research by Gary Hall (1992), Larry Blocher, and Richard Miles (1996) documents the nationwide decline in student enrollment in these classes under the 4 x 4 block system. Students who do drop out for one semester usually never return due to their finding other interests and the subsequent loss of skills during the term taken off. Other problems include the scheduling of music classes in conflict with classes such as singleton foreign language and Advanced Placement courses. This actually decreases the number of electives available to this specific population of students (Hall, 1992).

Findings

Several studies have been done with regard to block scheduling and test scores, student and teacher opinions, dropout rates, attendance, and subject-area grades. In a study by Wronkovick, Hess, and Robinson (1997), students in two Ohio school districts were studied in relation to their performance on local and state tests of mathematics. Their findings indicate that a year-long study of mathematics was preferred as it related to students' ability to perform on a test of college-level math skills. They inferred from their study that students who study math under a block scheduling format are at a disadvantage when competing against students who have studied math under traditional formats, and their data from the study supports this conclusion. Teacher impressions gathered from a qualitative study of those involved in the quantitative study include: (a) concerns over covering all of the material, (b) concern over "gaps" in the math learning process, (c) holding the attention of students for 90 minutes, and (d) the need for assimilation time between practice sessions. Their conclusions suggest that while there are merits to an intensified, block schedule, there are also serious questions about its effectiveness.

In a study of students in the Governor Thomas Johnson High School, the grade distribution in classes showed an increase in the number of As given, but no significant increase or change in the overall grade point averages (GPAs) of students when comparing their three year grade averages from 1989-1992 to their grade averages under block scheduling in 1992-1994 (Guskey & Kifer, 1994). This study also indicated that the daily attendance rate was unaffected by the change to the block schedule program, and remained at a steady rate. The student drop out rate also remained relatively stable with the implementation of the block schedule, but there was a significant difference

(20-30%) in the decline of students disciplinary actions. It is believed that this reduction may be due to the reduction in the time that students spend in the hallways and changing classes.

Data on actual test scores was gathered as part of a survey conducted by the Virginia Department of Education. The data presented scores from norm-referenced tests given to 11th grade students as part of the Virginia State Assessment Program. Students were grouped by the type of schedule and the demographics of the schools involved including urban, suburban, and rural settings. Through a correlation study of mathematics and reading scores, gains were seen by those students on the 4 x 4 block schedule (Shortt & Thayer, 1999).

Studies in Canada by David J. Bateson, professor of curriculum at the University of British Columbia, have found that there was no change, however, in the way in which teachers teach under block scheduling (1990). There was also no significant project-based work, debates, or other techniques that should lead to higher-level learning. Bateson suggests that if time and in-service education are provided, teaching will improve while using any system of scheduling. In another study by the Canadian Ministry of Education and Training, it was determined that the block schedule had no impact on student achievement in the reading scores of 130,000 students. A similar conclusion was reached by the North Carolina State Education Department which found that student scores on statewide tests neither increased of decreased on average in schools using a block schedule (Sommerfeld, 1996).

An anonymous survey instrument at the Huntington Beach Union High School District 50 (California), questioned teachers concerning their beliefs about block scheduling and instructional practices under the condition of block

scheduling (Staunton, 1997). Results from this survey indicate that teachers are generally satisfied with many aspects of block scheduling, such as minimized class disruptions and delays. Moving to a block schedule must be carefully initiated as a plan to institute desired changes in instruction and curriculum delivery. Block scheduling does not simply ensure meaningful changes will occur. Schools must identify clear educational goals for their students and teachers. As Dr. Richard Miles and Larry Blocher state in their book, Block Scheduling: Implications for Music Education, one particular schedule type may not fit everyone. Schools should be restructured around student learning and not necessarily time (Blocher & Miles, 1996).

Relationship. The school system used in this study began an investigation of block scheduling in 1995. Schools in other parts of the region were visited and guest speakers such as Dr. Robert Canady presented materials to committees and faculties on many aspects of block scheduling. Meetings were held with parents and students and a Block Scheduling Committee was formed to establish guidelines and procedures for implementing the 4 x 4 block. With the recommendations of the committee and the Board of Education, the school system adopted the 4 x 4 block schedule format during the fall of 1996. With this seen as a trend in education today, the committee's recommendations addressed the reasons to change to block scheduling which included:

1. An alternative option was needed to compensate for the increasing graduation requirements which limit the time for electives.
2. Discipline improves in schools using block scheduling.

3 Students focus on a more limited number of courses at any one time

4 Teaching techniques grow with the need to work differently in a reorganized time structure

5 Time is available to complete labs and projects in one class period

6 Less time is spent starting and stopping classes

7 Students are allowed to make up failed work during the regular school year without having to go to summer school or night school

After three years on a 4 x 4 block schedule, there should be an evaluation of the impact and effectiveness on the the students in the school system

Chapter 3

Methodology

Target Population

The target population consisted of high school students and teachers in a selected public school system. This system is comprised of six high schools with grades 9 through 12. Three of these schools have an average enrollment of 1500 students each and the remaining three consist of an average enrollment of 800 students each. The three larger schools are mostly suburban with middle and upper-middle class community settings. The smaller schools are more rural environments with predominantly middle class populations. The ethnic make-up of the students in the school system is less than 15% minority (including African-American and Asian). Each high school follows the same 4 x 4 block schedule format with the larger schools offering AP courses in all academic areas (smaller schools offer fewer AP courses, but they are available).

The student test scores used in this study were taken from SAT and ACT tests. These tests are now given to almost every student before graduation (usually during the junior and senior year of high school). The State mandated two-path system requires all students on the college-bound path to take one of these standardized tests. Those students on the technical-preparatory path may also take these tests and their scores are combined in the information available from the Tennessee Department of Education.

The student attendance rates were derived from the average daily attendance reports for the entire academic years studied. The students used in both the test score and attendance rate facets of the study were heterogeneously grouped 9th, 10th, 11th, and 12th grade students enrolled in the school system from 1995 until 1998.

The teachers involved in the teacher survey represented only those high school teachers who had taught under the block scheduling format in the studied school system for at least three years (Figure 1).

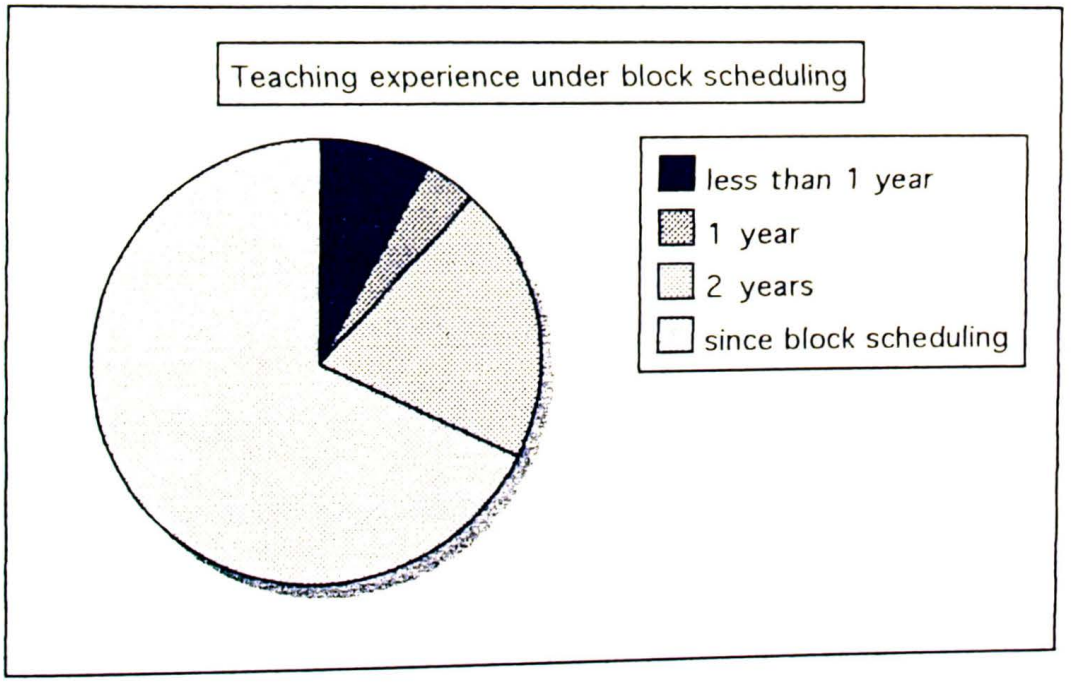

Figure 1

Teachers meeting this criteria reflected a diverse range of teaching experience (Figure 2).

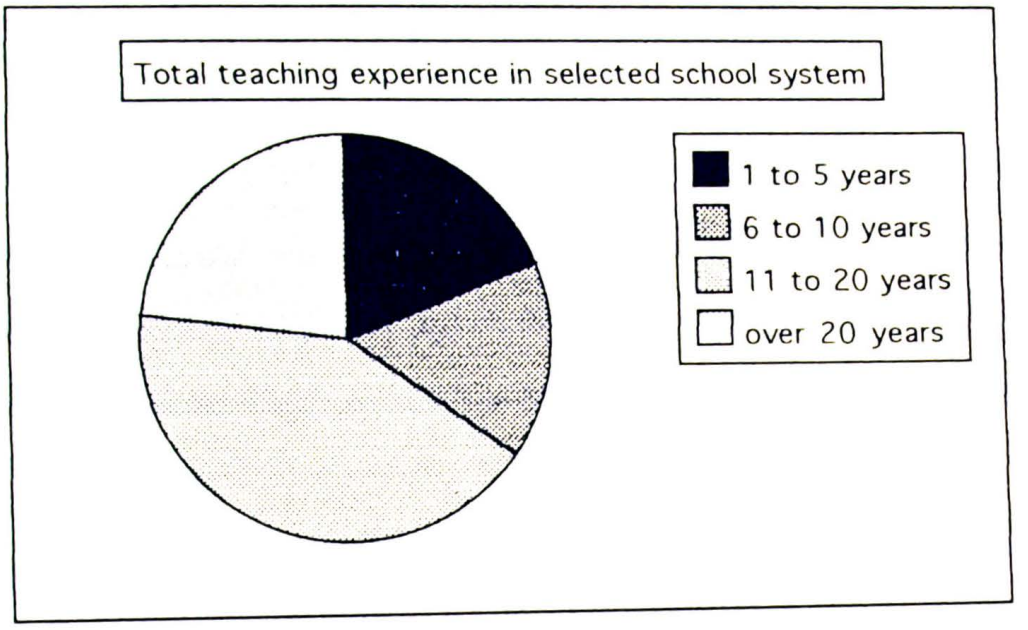

Figure 2

Design

To determine the impact and effectiveness of the 4 x 4 block schedule on the students involved in the school system used in this study, an examination was made of both qualitative and quantitative data. A comparison study involving standardized test scores, such as the ACT and the SAT was

In a request for permission to undertake this study, the Director of Schools was informed that students and teachers would not be placed in any physical or mental harm and the information obtained in this survey from the Board of Education was only to be used in this project. Confidentiality and anonymity was guaranteed (Appendix A-2).

A survey of teachers was conducted with the permission of the Director of Schools and the local principals (Appendix A-2; Appendix A-4). Surveys were sent to all high schools with an opportunity for all teachers to respond. This survey was based on the Huntingdon Beach survey and a Tennessee Education Association block scheduling survey which was modified for this field study.

The Huntingdon Beach study consisted of an anonymous 50 question survey instrument used with teachers concerning their beliefs about block scheduling and instructional practices under the condition of block scheduling. Findings from this survey addressed areas such as instructional practices, assessment techniques, student social interaction, curriculum, and school-wide management of students. Data was gathered demographically with regard to school site, department, number of years teaching, and number of years teaching under the block scheduling system.

The survey used by the Tennessee Education Association was part of an instruction and professional development packet developed for inservice workshops on block scheduling. This instrument was informal and was primarily used for local faculties to gain a better understanding of their beliefs concerning block scheduling and was not designed or utilized for any statistical research.

In the self-generated survey instrument used by teachers, questions were

predominantly from the Huntingdon Beach survey (Appendix A-6). However, several of the questions concerning actual instructional practices were modified from the Tennessee Education Survey. The questions used in this teacher survey were modified to address teacher perceptions of the effectiveness of block scheduling. A five-point Likert scale was used and respondents were instructed to choose one of five choices: "strongly disagree", "disagree", "no opinion", "agree", or "strongly agree." Values were assigned from 1 (strongly disagree), to 5 (strongly agree). The "no opinion" response was assigned a value of 3 and placed at the mid-range point. Questions were worded to elicit positive responses.

While all teachers had the opportunity to respond with anonymity and confidentiality, only those who indicated that they had taught in the school system for at least three years were used in the study, since they had practical experience with both the 4 x 4 block schedule and the traditional six-period day.

Teachers granted consent to participation by returning the completed surveys through the school system's mail courier in pre-addressed envelopes that were provided. The teachers were also given a written description of their rights and responsibilities concerning their participation in this project.

Procedures

Data collected from standardized test scores and average daily attendance records was recorded in a table. Information from the survey instruments was compiled in tables containing the scores used in the surveys. Test score comparisons would reveal any trends in student academic performance. While differences in academic performance may not be specifically linked to scheduling changes, these differences could be used to determine if there has been any significant effect of the students' progress. By

comparing average daily attendance rates from the years before block scheduling with those recorded after block scheduling was implemented, information could be gathered to determine any actual gains that have been made in these areas.

Teacher surveys provide qualitative information of the attitudes and perceptions of those involved in block scheduling on a daily basis. By using information from teachers who have taught under both the 4 x 4 block and the traditional six-period day, useful data may be obtained as to the perceived effectiveness of block scheduling. This information may also be used to determine if the original goals which provided the impetus for changing scheduling systems have been achieved through the 4 x 4 block schedule.

Chapter 4

Results

In order to determine the implications of the 4 x 4 block scheduling format on high school students in a particular school system, both objective and qualitative data were gathered for study.

Objective data

Standardized test scores. In order to evaluate the implications of the 4 x 4 block schedule on the school system under study, a comparison of the system's test scores from the last two years before block scheduling implementation to those scores during the first two years was undertaken. These system mean scores were also compared to those of the state and national mean scores.

Table 1 shows that English area scores on the ACT had actually increased before the first year of block scheduling in the 1996-1997 school year. A significant decrease in this area was noted for the first year of block scheduling with a slight increase in the second year. This is in contrast to the state means which have shown only a slight decline during the same period and a steady rate during the second year. The national mean has maintained a consistent rate and a slight increase during this time period.

Table 1

Comparison of ACT English Area Scores

1995-1998

Mean Scores	1995	1996	1997	1998
National	20.3	20.3	20.3	20.4
State	22.6	19.8	19.6	19.6
System	20.8	21.3	19.9	20.4

Notes: ACT = American College Test.
1995-1996 = before block scheduling.
1997-1998 = after block scheduling.

In table 2, similar trends in the local system's scores in the Mathematics area ACT scores are indicated with a slight decline during the first year of block scheduling and a slight increase during the second year. State and national scores have shown small increases during the same time period.

Table 2

Comparison of ACT Mathematics Area Scores

1995-1998

Mean Scores	1995	1996	1997	1998
National	19.3	20.2	20.6	20.8
State	21.7	18.9	19.0	19.1
System	19.8	20.1	19.5	20.0

Notes: ACT = American College Test.
1995-1996 = before block scheduling.
1997-1998 = after block scheduling.

Table 3 indicates a slight decline in the Reading area ACT scores of the school system during the first year of block scheduling and a slight increase during the second year. While the state means followed a similar pattern, the national scores indicated a slight increase during the same time period.

Table 3

Comparison of ACT Reading Area Scores

1995-1998

Mean Scores	1995	1996	1997	1998
National	21.0	21.3	21.3	21.4
State	23.1	20.4	20.1	20.2
System	21.5	21.6	20.4	21.1

Notes: ACT = American College Test.
1995-1996 = before block scheduling.
1997-1998 = after block scheduling.

Table 4 also indicates a decline in the Science area ACT scores from the school system's mean scores for the first year of block scheduling and a slight increase during the second year. The state mean scores have followed a similar pattern and the national scores have maintained a steady rate during the period studied.

Table 4

Comparison of ACT Science Reasoning Area Scores

1995-1998

Mean Scores	1995	1996	1997	1998
National	20.3	21.1	21.1	21.1
State	22.0	19.9	19.7	19.8
System	20.4	20.6	19.9	20.5

Notes: ACT = American College Test.
1995-1996 = before block scheduling.
1997-1998 = after block scheduling.

Table 5 indicates a slight decrease in the school system's overall composite ACT score during the first year of block scheduling and a slight increase during the second year. State means indicate a similar pattern and national scores show a slight increase during this time period.

Table 5

Comparison of ACT Composite Scores

1995-1998

Mean Scores	1995	1996	1997	1998
National	20.3	20.9	21.0	21.0
State	22.5	19.9	19.7	19.8
System	20.8	21.0	20.1	20.6

Notes: ACT = American College Test.
1995-1996 = before block scheduling.
1997-1998 = after block scheduling.

In comparing Verbal scores from the SAT, table 6 indicates that the school system's scores during the first year of block scheduling dropped and then increased during the second year. The system's scores also had dropped significantly from the year before block scheduling was implemented. State means have increased and maintained a consistent rate during this same period, but had also dropped from the year before the scheduling system had been implemented in the studied school system. National mean scores have maintained a steady rate for the same time period.

Table 6

Comparison of SAT Verbal Scores

1995-1998

Mean scores	1995	1996	1997	1998
National	504	505	505	505
State	571	563	564	564
System	581	572	571	575

Notes: SAT = Scholastic Aptitude Test.
1995-1996 = before block scheduling.
1997-1998 = after block scheduling.

Table 7 indicates the system and state scores on the Mathematics portion of the SAT experienced a decline before the system's adoption of the 4 x 4 block scheduling format, and a steady rate of increase since the implementation. The national mean has shown consistent increases for the studied time period.

Table 7

Comparison of SAT Mathematics Scores

1995-1998

Mean scores	1995	1996	1997	1998
National	506	508	511	512
State	560	552	556	557
System	572	567	567	573

Notes: SAT = Scholastic Aptitude Test.
1995-1996 = before block scheduling.
1997-1998 = after block scheduling.

SAT composite scores are indicated in table 8. The school system and state both experienced a decline in their scores in the period before the system implemented block scheduling. The school system's scores continued to decline after block scheduling's implementation and experienced an increase during the second year. The national mean scores have steadily increased over the time period studied.

Table 8

Comparison of SAT Composite Scores

1995-1998

Mean scores	1995	1996	1997	1998
National	1010	1013	1016	1017
State	1131	1115	1120	1121
System	1153	1139	1138	1148

Notes: SAT = Scholastic Aptitude Test.
1995-1996 = before block scheduling.
1997-1998 = after block scheduling.

Attendance rates. Attendance rates for the years 1994-1998 were studied to determine any changes in attendance patterns that may have occurred either before or after the implementation of block scheduling. These patterns from the studied school system were compared to those of the State for the same time period. Table 9 indicates that the state ADA rates have gradually increased during this period. The school system's average daily attendance rates experienced a slight decline before block scheduling was implemented and this pattern continued until the second year of the 4 x 4 format, when the attendance rate increased by 1.5 percentage points.

Table 9

Comparison of Average Daily Attendance Rates,

1994-1998

	Before Block Schedule	Before Block Schedule	After Block Schedule	After Block Schedule
	1994-95	1995-96	1996-97	1997-98
State	91.8	92.1	92.01	92.4
System	93.6	92.5	91.7	93.2

Tests for validity of instrument. Six professional educators with an interest in educational research examined the self-generated survey instrument for face and content validity. The following suggestions were made for the instrument:

1. Consent documents do not contain all of the required elements.
2. Language in the teacher consent document is unclear with instructions.
3. Method for administering the survey must ensure anonymity.

These suggestions were addressed and incorporated into the final draft of the survey in the following manner:

Consent documents do not contain all of the required elements. Language in the teacher consent document is unclear with instructions. The separate consent document was deleted. Language in the instructions was changed to inform teachers of their legal rights in conjunction with participation in the survey, and assurance of "no penalty" for non-participation.

Method for administering the survey must ensure anonymity. Surveys were distributed by the investigator to all high school certificated personnel. Each survey was attached to a pre-addressed envelope for participants to use in returning the finished survey through the school system's courier mail.

Tests for reliability of instrument. To determine the internal consistency of the self-generated survey instrument, the split-half method to determine the correlation coefficient for reliability was calculated. From the 157 surveys used in the study, 30 were randomly selected and assigned a number. The total number of questions on the survey was 24, with two of those used for demographical information (question 23 and 24; Appendix A-6). All questions

were designed to be answered in a positive manner. The correlation coefficient for reliability for the self-generated survey instrument was 0.943.

Validity and Reliability Checks

Reliability of instrument:

Survey #	Odd Total	Even Total	Odd Rank	Even Rank	D	D^2
001	55	55	1	1	0	0
030	52	52	2	2	0	0
021	50	52	3	2	1	1
015	48	52	4	2	2	4
018	47	52	5	2	3	9
025	47	52	5	2	3	9
024	46	52	6	2	4	16
019	43	46	7	3	4	16
010	43	41	7	7	0	0
022	42	44	8	5	3	9
002	42	32	8	15	-7	49
014	41	45	9	4	5	23
012	41	42	9	6	3	9
023	41	42	9	6	3	9
011	41	35	9	13	-4	16
027	40	39	10	9	1	1
006	39	42	11	6	5	25
007	39	42	11	6	5	25
003	37	36	12	12	0	0
016	37	40	12	8	4	16
013	36	38	13	10	3	9
028	36	37	13	11	2	4
020	36	34	13	14	-1	1
005	35	34	14	14	0	0
008	30	31	15	16	-1	1
029	30	31	15	16	-1	1
004	29	32	16	15	1	1
026	18	28	17	17	0	0
017	15	19	18	18	0	0
009	11	11	19	19	0	0

$$1 - \frac{6(\text{Sum of } D^2)}{N(N^2 - 1)} = 1 - \frac{6(256)}{30(899)} = 1 - \frac{1536}{26970} = 1 - 0.057 = \mathbf{0.943}$$

Teacher opinion surveys. An original survey instrument was given to all high school teachers in the school system to determine their perceptions of block scheduling's impact on their teaching and their student's learning. The six high schools in the system had 420 surveys distributed to their faculties. 232 surveys were returned. Of those returned, 157 were determined to meet the criteria for use in this study. Question number 23 asked how many years the subjects had been teaching under the block scheduling format in the school system. Only those who responded that they had been teaching in the school system since the block scheduling system was introduced were used. The percentages of those responding to each question was tabulated and is listed along with each question.

Table 11

Teacher Attitude Survey

Key: SD = strongly disagree
D = disagree
NO = no opinion
A = agree
SA = strongly agree

Question	SD	D	NO	A	SA
1. High functioning students are well served by block scheduling.	4% (6)	10% (15)	7% (10)	33% (51)	46% (71)
2. Good students are served well by block scheduling.	4% (6)	12% (18)	6% (9)	42% (65)	36% (55)
3. Average students are well served by block scheduling.	8% (12)	14% (21)	8% (13)	44% (68)	26% (39)

4.	At-risk students are well served by block scheduling.	13% (20)	20% (30)	19% (29)	27% (42)	21% (32)
5.	Students are more productive under block scheduling.	7% (11)	14% (21)	13% (19)	40% (62)	26% (39)
6.	Students are more relaxed under block scheduling.	7% (11)	14% (21)	13% (20)	33% (50)	33% (50)
7.	I complete more units of instruction under block scheduling.	21% (32)	29% (44)	14% (21)	21% (33)	15% (23)
8.	I am able to vary my instructional practices because of block scheduling.	4% (6)	5% (8)	5% (8)	40% (61)	46% (70)
9.	I am more accurate in assessing my students' understanding with block scheduling.	7% (11)	15% (23)	22% (33)	29% (44)	27% (42)
10.	I devote less time in class to lecturing under block scheduling.	4% (6)	22% (33)	14% (22)	33% (50)	27% (42)
11.	I allow students to complete more homework in class under block scheduling.	14% (21)	21% (32)	20% (31)	33% (50)	12% (42)
12.	I cover material in greater detail due to block scheduling.	12% (18)	23% (35)	7% (11)	37% (57)	21% (33)
13.	I assign less homework due to the longer class periods.	16% (24)	20% (30)	21% (32)	31% (48)	12% (19)

14. There is less wasted time (non-instructional) under block scheduling.	9% (13)	15% (22)	12% (18)	37% (56)	27% (41)
15. There are fewer disciplinary problems in my classroom due to block scheduling.	7% (10)	7% (27)	28% (42)	29% (44)	19% (29)
16. There are fewer disciplinary problems in our school due to block scheduling.	8% (12)	11% (17)	36% (54)	23% (35)	22% (34)
17. I have assigned better grades to students under block scheduling.	9% (14)	24% (36)	24% (38)	33% (50)	10% (15)
18. Student motivation to learn has increased due to block scheduling.	12% (18)	17% (26)	34% (53)	29% (45)	8% (12)
19. It is difficult to maintain student interest for the longer periods.	18% (27)	34% (52)	11% (16)	23% (35)	14% (21)
20. Students involved in athletics and extra-curricular activities lose less time under block scheduling.	13% (20)	16% (25)	30% (45)	25% (38)	16% (24)
21. There are fewer class scheduling conflicts under block scheduling.	11% (17)	14% (21)	37% (57)	23% (36)	15% (23)
22. I prefer the 4 x 4 block schedule over the traditional six-period day.	13% (20)	8% (12)	5% (7)	17% (26)	57% (89)

23. I have been teaching under the block schedule in this school system for:

less than one year	8%	(19)
1 year	4%	(9)
2 years	20%	(47)
since block scheduling was introduced	68%	(157)

24. My total teaching experience in this school system is

1 to 5 years	19%	(29)
6-10 years	16%	(25)
11-20 years	42%	(64)
over 20 years	23%	(35)

Note: Actual numbers are in parentheses. Based on 157 usable responses. Not all respondents replied to every question.

Summary

The objective and qualitative data gathered for this field study were used to determine the implications of the 4 x 4 block schedule format on the studied school system. The system's original goals are also discussed in Chapter 5 in order to determine what effect the block scheduling format has had on the high school students involved in this school system.

Chapter 5

Conclusions

Discussion

This field study has discussed the history and current practices of block scheduling on several different levels of education. In evaluating the implications of the 4 x 4 block scheduling system on the high school students in a particular school system, the originally stated goals for implementing the change to this format should be discussed, along with the data from standardized test scores and attendance rates, and an evaluation of related literature.

Academic Performance

A comparison of standardized test scores from the selected school system reveals that there has been a slight decline in the composite scores of students taking the SAT and/or the ACT since block scheduling was

implemented (Table 5; Table 8). It should also be noted that this follows a state-wide trend and could possibly be related to the change in graduation requirements in which all students on the college bound track must take either the ACT or the SAT. This was not a requirement in 1995, and the student population may have been more academically selective during that period. This is important to mention since the national averages have actually experienced a slight increase over this same segment of time. In specific subject areas, the data shows that English, Reading (ACT) and Verbal (SAT) scores actually experienced a decline and Science Reasoning (ACT) and Mathematics (ACT and SAT) have shown a slight increase.

With no true pretest/post-test type situation in place, it is circumstantial to attribute this decline entirely to block scheduling. It must also be considered that each year's scores are the products of different groups of students which makes an accurate statistical correlation impossible. It can be concluded, however, that the implementation of the 4 x 4 block schedule has had little impact on the academic performance of students in the selected school system.

Attendance

Since the implementation of the 4 x 4 block schedule, the selected school system has experienced a slight decline in the ADA rates. This is in contrast to the state means which show slight increases from the same time period. It is important to note that this is a yearly ADA rate. The major impact on the studied school system has been after the first term when the December graduation rates have risen. This causes lower student population in the second term and has resulted in substantial monetary losses from the state since funds are partly based on enrollment and attendance.

The decline on the local level with attendance does not support the

premise that block scheduling increases student attendance. The type of scheduling has had little impact on the attendance rates.

Teacher Attitudes

The demographics of the self-generated survey provided insight into teacher perceptions of block scheduling and a means to evaluate the achievement of the school system's original goals for the 4 x 4 block schedule implementation.

To provide an alternative for electives. In the self-generated teacher survey that was distributed, questions 20 and 21 dealt with scheduling. Forty-one percent of those responding indicated that they believed that students involved in athletics and extra curricular activities lose less time under block scheduling. Thirty-eight percent of those responding indicated that there are fewer class scheduling conflicts under the 4 x 4 block system. While graduation requirements have increased, the number of credits can only be increased to a maximum of twenty-eight units or one of the premises of the block schedule becomes a moot point (that of students being able to repeat failed subjects immediately without summer school or night school). Information from Table 9 fails to indicate any significant changes in the Average Daily Attendance records over the entire two-year period of block scheduling that could be specifically traced to this system of student time management.

To improve school discipline. Survey questions 15 and 16 related to teacher perceptions of student discipline. Forty-eight percent of respondents indicated fewer classroom discipline problems and 45% indicated fewer school-wide discipline problems. These were attributed by the respondents to block scheduling. This may be due to less student movement between classes

(because there are fewer classes and class changes) and less chance for student altercations.

To allow students to focus on a more limited number of courses. With only four classes during a day instead of six, the results of this are obvious. The survey respondents indicated through questions 5 and 6 that they believed students were more relaxed and productive under block scheduling (67% and 66%, respectively).

To allow for different teaching techniques. Question number 8 indicated that 86% of those responding believed that they were able to use a variety of instructional practices under the block scheduling system; however, question 7 indicated that 37% do not believe that they complete any more units of instruction. Fifty-eight percent believe that they cover material in greater detail under the block schedule (question 12), and 60% indicated that they devote less time to a lecture format in their classrooms.

To allow for time to complete projects in one class period. Question 13 on the survey indicated that 43% believed they assign less homework due to the 4 x 4 block schedule and 45% actually allow students to complete "homework" during class time (question 11).

To spend less time starting and stopping classes. Sixty-four percent of respondents indicated that they believe there is less "wasted" (non-instructional) time under block scheduling (question 14).

To allow students to make up failed work during the regular school year. In the area of student assessment, question 9 indicated that 56% of the responding teachers believed they were more accurate in assessing their students level of understanding. Forty-three percent also indicated that they have assigned better grades to students under block scheduling (question 17).

Question 18 indicated that 37% of the respondents believed that student motivation to learn has increased and 52% indicated that the longer class periods do not make it more difficult to maintain student interest. According to the survey respondents, over 70% believed that average, good, and high functioning students are well-served by the 4 x 4 block schedule. Only 48%, however, indicated that at-risk students' needs were served best by the 4 x 4 block schedule format.

Evaluation of Related Literature

Current literature reveals the two opposite opinions of block scheduling. There seem to be an equal number of proponents and opponents on this issue. Ironically, some of the same data and opinions are used on both sides of the discussion!

The length of classes is seen to be a positive factor for some subjects, but a detriment in others. Opportunities to complete projects within the longer classes is seen as an advantage, but some argue that these projects have been added simply as sponge activities to take-up the extra time. Smaller classes are seen as a positive factor, but the changing of schedules every term limits the exposure of one teacher to any particular student. The longer time frames have caused some teachers to change their methods, thus providing for revaluation and growth for many teachers. Others, however, have resisted this challenge, and simply lecture longer.

Definite problems with the 4 x 4 block involve the scheduling of AP classes and other class scheduling conflicts. With only four periods from which to choose, it is harder to fit specific classes into a schedule than when there are six periods in which to choose. The retention of information is also seen as a problem that needs to be addressed. Studies in Canada provide evidence that

there is an adverse effect on test scores resulting from the lapses of time between sequential classes (Gore, 1996). A related concern is that of the large amount of time if a student finishes a required class in their 10th grade year and then is not exposed to that subject matter until a college entrance exam up to two years later.

Many of the advantages touted by supporters of block scheduling relate specifically to the management of students. Benefits such as decreasing the number of class changes, reducing the number of teacher preparations, increasing teacher planning time and the creation of a more relaxed environment, while important, are not specifically linked to academic performance and achievement. More of the disadvantages, such as problems with the scheduling of AP classes, concern over sequential course scheduling, concern over student retention of material, and the actual decrease in "clock hours" taught, seem to address areas of student learning more directly.

Summary

The null hypothesis is accepted after studying the gathered data and the literature. The 4 x 4 block schedule has had no effect on the overall ADA or student achievement (as exhibited through standardized test scores) of the studied school system. Teachers in the system since the change to the 4 x 4 block format see the effects as a positive change.

While the original goals of the school system appear to have been mostly achieved, the question still remains if these goals were actually perceived as problems, thus necessitating the change. Was school discipline a problem on a system-wide level? Were students working on too many areas to maintain their focus? Do all subjects need extra time for projects? Is a scheduling change the most effective way to initiate different teaching techniques? Do failing

students need the opportunity to make up failed work within the regular school year, or is summer school and night school still necessary?

The 4 x 4 block schedule allows for several advantages as discussed in the literature review and the results, but disadvantages also exist for other areas in the day to day educational process. Some classes and teachers prefer a longer instructional period, however, with one-fourth of the teachers not being in favor of the 4 x 4 block, it remains clear that this may not be the best format for every subject and every teacher.

Based on the analysis of the data presented in this study, it can be concluded that while most teachers prefer the 4 x 4 block system and feel that it has been beneficial to students, the academic performance and attendance rates for students have actually produced minimal decreases in achievement. It is therefore recommended that the 4 x 4 block scheduling system be changed to a modified block schedule or a traditional six-period day.

The primary factors in determining a type of scheduling should not be those that deal with student management, faculty planning periods, ease of scheduling and paperwork, or costs of programs. The type of scheduling should reflect the needs of student learning and the most effective way to impart the knowledge and skills deemed necessary by the school system. If schools are restructured, they should be restructured around student learning, and not the clock or the calendar.

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APPENDIXES

APPENDIX A-1
Letter to Director of Schools

227 Southburn Drive
Hendersonville, TN 37075
October 27, 1998

Mr. Merrol Hyde
Director of Schools
Sumner County Board of Education
225 E. Main Street
Gallatin, TN 37066

Dear Mr. Hyde:

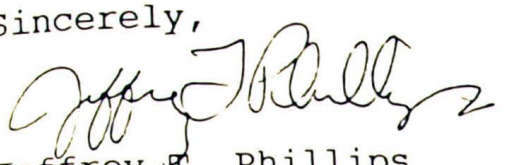
I am currently beginning the field study project to complete an Ed.S. degree from Austin Peay State University. In a previous conversation, I mentioned to you that I would like to compile data concerning the 4 x 4 block scheduling system. This would include obtaining standardized test score information, average daily attendance records, and graduation/dropout rate information. Also, I would like to conduct a random survey of students and teachers concerning their opinions of block scheduling. The qualitative and quantitative data collected will hopefully show the impact of block scheduling (positive or negative) on high school students in Sumner County schools.

I will need to obtain official "written permission" from your office to proceed further with this field study in accordance with regulations and procedures at APSU. A letter stating that I have permission to obtain the statistical data from Mr. Rick Eaton, Testing Coordinator and a separate letter that I may send to the Principals of each high school to conduct the surveys will enable me to begin.

The survey instrument contains only questions that pertain to opinions concerning instruction, teaching methods, use of time, effectiveness, and years of teaching/grade in school.This information will be used only for this field study and for presentation to the Sumner County Board of Education and will not place any participants in psychic, legal, physical, or social harm. Subjects will respond to the survey and return it through the Sumner County school courier to me at Hendersonville High School. Principals will be asked to distribute these surveys to teachers in their buildings who have taught for at least three years (thus teaching under both the 4 x 4 block schedule and the traditional six-period day). Student surveys should be distributed randomly to 11th and 12th grade students (possibly in English classes), also targeting students who have been instructed under both scheduling systems.

Thank you in advance for your assistance with this study. I will be happy to report the results after approval of the final paper in May of 1999.

Sincerely,



Jeffrey T. Phillips

APPENDIX A-2
Letter from Assistant
Director of Schools

Sumner County Board of Education

Merrol N. Hyde, Director of Schools
225 East Main Street
Gallatin, TN 37066-2987

(615) 451-5200
Fax (615) 451-5216

November 5, 1998

Jeffrey T. Phillips
227 Southburn Drive
Hendersonville, TN 37066

Dear Mr. Phillips:

Your proposal looks to be very appropriate and timely. Both the Director of Schools, Mr. Merrol Hyde, and I have read and we will approve your conducting this study in Sumner County Schools.

We ask you to guarantee the following items to obtain our approval:

1. At no time will the Sumner County School System or individual school names be identified in your study.
2. At no time will the procedural implementation of your study adversely interfere with the instruction of students in Sumner County schools (You may have surveys administered during class time, but only with the principal's approval and teacher's supervision).
3. Complete confidentiality and anonymity will be given to all individuals, including administrators, teachers, parents, and students.
4. We will be given a copy of the results and a copy of what is to be submitted a minimum of 5 days before your submitting it for approval.
5. Moreover, we have the right to review and prohibit submission and/or publication contingent upon the adherence to the above mentioned items.

I hope you do not find these requirements too constraining, but they are necessary from a legal standpoint.

I look forward to seeing the results. Good Luck.

Sincerely,

Loren J. Helbig

Loren Jeffrey Helbig

Assistant Director of Schools
Sumner County Board of Education

Cc: Merrol Hyde, Director of Schools

APPENDIX A-3
Letter of Consent to
Assistant
Director of Schools

227 Southburn Drive
Hendersonville, TN 37075
November 23, 1998

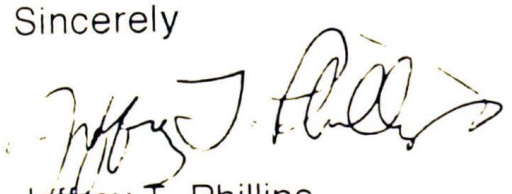
Loren Jeffrey Helbig
Assistant Director of Schools
Sumner County Board of Education
225 East Main Street
Gallatin, TN 37066-2987

Dear Mr. Helbig:

Thank you for your time and cooperation with my field study at Austin Peay State University. I have read the guidelines and they are acceptable to me. The memo from you will be fine, but I would appreciate it if you would wait until I have cleared everything with my newest advisor and committee chairperson and then I will begin the survey process and gathering of information from Mr. Eaton.

I will be back in contact with you soon. Thank you again for your assistance.

Sincerely



Jeffrey T. Phillips

APPENDIX A-4
Memorandum to Principals
from
Assistant Director of Schools

Sumner County Board of Education

Merrol N. Hyde, Director of Schools
225 East Main Street
Gallatin, TN 37066-2987

(615) 451-5200
Fax (615) 451-5216

INTEROFFICE MEMO

DATE: 11/6/1998

FROM: JEFF HELBIG
ASSISTANT DIRECTOR OF SCHOOLS

TO: ALL HIGH SCHOOL PRINCIPALS AND RICK EATON

RE: ACADEMIC STUDY BEING CONDUCTED BY JEFFREY PHILLIPS

Mr. Jeffrey Phillips will be conducting a graduate level academic study. We have reviewed the Pproposal and will be giving our approval for it to be conducted in our schools. He will need to obtain statistically information from Mr. Eaton, and conduct surveys, observations and possibly interviews of students at our high schools. He will be allowed to use our courier system as a means to collect information.

We have asked that he do the following to be given our approval:

1. At no time will the Sumner County School System or individual school names be identified in your study.
2. At no time will the procedural implementation of your study adversely interfere with the instruction of students in Sumner County schools (You may have surveys administered during class time, but only with the principal's approval and teacher's supervision).
3. Complete confidentiality and anonymity will be given to all individuals, including administrators, teachers, parents, and students.
4. We will be given a copy of the results and a copy of what is to be submitted a minimum of 5 days before your submitting it for approval.
5. Moreover, we have the right to review and prohibit submission and/or publication contingent upon the adherence to the above mentioned items.

He will also be directed to inform your office when he is present in your building, and to obtain your permission as to the time that he may perform the procedures needed to conduct his study.

Thank You.

LJH

Confidential

APPENDIX A-5
APSU Human Subjects Checklist

AUSTIN PEAY STATE UNIVERSITY

CHECKLIST FOR RESEARCH INVOLVING HUMAN SUBJECTS

TITLE: Implications of the 4 x 4 Block Schedule on High School Students

FUNDING SOURCE: author

PRINCIPAL INVESTIGATOR: Jeffrey T. Phillips
DEPARTMENT: Education

SPONSOR (if student research): Dr. Ann Harris

1. Give a brief description or outline or your research procedures as they related to the use of human subjects. This should include a description of the subjects themselves, instructions given to them, activities in which they engage, special incentives, and tests and questionnaires. If new or non-standard tests or questionnaires are used, copies should be attached to this form. Note if the subjects are minors or "vulnerable" (children, prisoners, mentally or physically infirm, etc.).

   The subjects used in the author's original survey will be high school teachers in a school system who have taught for at least three years. A question on the survey (attached) will allow for the anonymous selection of teachers who meet this criteria. In the instructions given to teachers, they will be informed that by returning the completed surveys they are consenting to participation in the research and understand the conditions of participation.

2. Does this research entail possible risk to psychic, legal, physical, or social harm to the subjects? Please explain. What steps have been taken to minimize these risks? What provisions have been made to insure that appropriate facilities and professional attention necessary for the health and safety of the subjects are available and will be utilized?

   There are no psychic, legal, physical, or social risks to students or teachers involved in these surveys.

3. The potential benefits of this activity to the subjects and to mankind in general outweigh any possible risks. This opinion is justified by the following reasons:

   The information gained through these surveys will provide valuable insight to the perceptions of students and teachers who are actively involved on a day to day basis with a typical 4 x 4 block scheduling system. This information will add to the body of research currently being undertaken on block scheduling in schools across the nation.

4. Will legally effective, informed consent be obtained from all subjects or their legally authorized representatives?

   Written permission has been obtained from the Director of schools through the Assistant Director, who is assisting with the gathering of information. Teachers given the survey will be informed that by returning the questionnaire they are granting consent.

5. Will the confidentiality/anonymity of all subjects be maintained? How is this accomplished? (If not, has a formal release been obtained? Attach). (a) If data will be stored by electronic media, what steps will be taken to assure confidentiality/anonymity? (b) If data will be stored by non-electronic media, what steps will be taken to assure confidentiality/anonymity?

   The original teacher survey written by the author will have no indication of school or individual names. Teachers will also be provided with addressed envelopes to return the surveys through the school system's courier mail system. The actual surveys will be kept by the author of the field study and destroyed upon completion of the project.

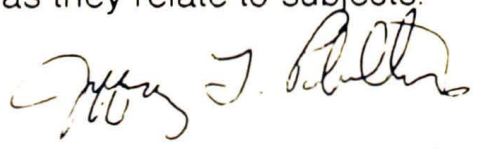
6. Do the data to be collected relate to illegal activities? If yes, explain.

   No.

7. Are all subjects protected from the future potentially harmful use of the data collected in this investigation? How is this accomplished?

   The information gathered will be done through the anonymous surveys as previously mentioned. The guidelines from the Assistant Director of Schools require that no mention may be made in the field study paper that specifically mention the school system investigated or any specific school or individual.

I have read the Austin Peay State University Policies and Procedures on Human Research and agree to abide by them. I also agree to report to the Human Research Review Committee any significant and relevant changes in procedures and instruments as they relate to subjects.

Signature  Date 4/17/99

Student research directed by faculty should be co-signed by faculty supervisor.

Signature Date

Anne Harris 4/17/99

APPENDIX A-6
Self-generated Teacher Survey Instrument

Teacher Survey of Block Scheduling

You are being asked to be a participant in the research project entitled "Implications of the 4 X 4 Block Schedule on High School Students." This research is being conducted by Mr. Jeffrey T. Phillips, candidate for the Ed.S. degree at Austin Peay State University. The Purpose of this research is to determine the implications of the 4 X 4 block schedule on high school students and will constitute only a portion of the data gathered on this project.

You will be asked questions about your beliefs and opinions concerning block scheduling. Participation will require filling out a survey that will take no more than ten minutes. This survey will be distributed to all high school teachers in our system.

There will be no penalty should you choose not to participate. Your answers will be kept entirely anonymous. Your name, school name, or school system name will never appear on any research document, and no individual answers will be reported. Only group results will be made available.

This research may help us learn about the effects and implications of block scheduling and you retain the right to ask and have answered any questions that you have about the research project by contacting either Mr. Jeffrey T. Phillips at Hendersonville High School (615-824-4526), or Dr. Ann Harris at Austin Peay State University (931-648-7696). You also retain the right to receive a summary of the research results after the completion of the project.

Completion and return of the survey constitutes informed consent to participate in this research project. Please place the completed survey in the envelope provided and return it through the county courier to Mr. Phillips by the end of the day in which you receive it. Thank you for your time and assistance.

Circle the appropriate answer for each question below using the following scale:

1 strongly disagree
2 disagree
3 no opinion
4 agree
5 strongly agree

Circle only one response per item.

1. High functioning students are well served by block scheduling. 1 2 3 4 5
2. Good students are served well by block scheduling. 1 2 3 4 5
3. Average students are well served by block scheduling. 1 2 3 4 5
4. At-risk students are well served by block scheduling. 1 2 3 4 5
5. Students are more productive under block scheduling. 1 2 3 4 5
6. Students are more relaxed using block scheduling. 1 2 3 4 5
7. I complete more units of instruction using block scheduling. 1 2 3 4 5

8. I am able to vary my instructional practices because of block scheduling. 1 2 3 4 5

9. I am more accurate in assessing my students' level of understanding due to block scheduling. 1 2 3 4 5

10. I devote less time in class to lecturing under block scheduling. 1 2 3 4 5

11. I allow students to complete more homework in class under block scheduling. 1 2 3 4 5

12. I cover material in greater detail due to block scheduling. 1 2 3 4 5

13. I assign less homework due to the longer class period. 1 2 3 4 5

14. There is less wasted (non-instructional) time under block scheduling. 1 2 3 4 5

15. There are fewer disciplinary problems in my classroom due to block scheduling. 1 2 3 4 5

16. There are fewer disciplinary problems in our school due to block scheduling. 1 2 3 4 5

17. I have assigned better grades to students under block scheduling. 1 2 3 4 5

18. Student motivation to learn has increased due to block scheduling. 1 2 3 4 5

19. It is difficult to maintain student interest for the longer class period. 1 2 3 4 5

20. Students involved in athletics and extra-curricular activities lose less time under block scheduling. 1 2 3 4 5

21. There are fewer class scheduling conflicts under block scheduling. 1 2 3 4 5

22. I prefer the 4 x 4 block schedule over the traditional six-period day. 1 2 3 4 5

23. I have been teaching under the block schedule in this school system for
    (1) less than one year
    (2) 1 year
    (3) 2 years
    (4) since block scheduling was introduced

24. My total teaching experience in this school system is
    (1) I year or less
    (2) 1 to 5 years
    (3) 6-10 years
    (4) 11-20 years
    (5) over 20 years

VITA

VITA

Jeffrey Taylor Phillips was born in Florence, South Carolina on May 22, 1961. His family moved to Old Hickory, Tennessee in 1964 where he attended public schools there and graduated from DuPont Senior High School in 1979. He attended Middle Tennessee State University from 1979 until 1982. In 1982, he performed in the World's Fair Band at the 1982 Knoxville International Energy Exposition. He returned to Middle Tennessee State University in 1983 and received his Bachelor of Music Education degree in 1984. In September of 1984, he entered Western Kentucky University, where he was the Graduate Assistant Director of Bands, receiving the Master of Arts in Education in 1986. Upon graduation, he became Director of Bands at Hendersonville High School in Hendersonville, Tennessee. In January, 1997, he entered Austin Peay State University and received the Education Specialist degree in Secondary Education in May, 1999.

He is currently the Director of Bands at Hendersonville High School and is active in local, state, and national professional organizations in addition to being a free lance professional trombonist in the Nashville area.