

1993

## A study of the relationship between scheduling practices and selected Outcome Accountability Project indicators in Virginia high schools

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**Lewis, Jonathan Leopold, Ed.D.**

**The College of William and Mary, 1993**

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A STUDY OF THE RELATIONSHIP BETWEEN SCHEDULING PRACTICES  
AND SELECTED OUTCOME ACCOUNTABILITY PROJECT INDICATORS  
IN VIRGINIA HIGH SCHOOLS

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A Dissertation  
Presented To  
The Faculty of the School of Education  
The College of William and Mary in Virginia

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In Partial Fulfillment  
Of the Requirements for the Degree  
Doctor of Education

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by  
Jonathan Leopold Lewis  
August 1993

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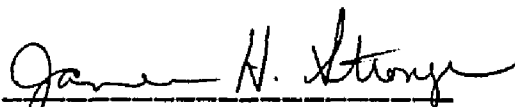
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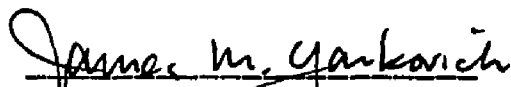
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Approved August 1993 by



James H. Stronge, Ph.D.  
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## DEDICATION

This dissertation is dedicated to my wife, Claudette, and my children, Nathan and Adrienne, who have offered support, love, and understanding throughout the many years I have been pursuing the doctorate degree.

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ABSTRACT

Since the publication of A Nation at Risk in 1983, educational theorists and practitioners have begun to reevaluate the business of schooling in America. In Virginia, the Department of Education has instituted World Class Education (WCE), Common Core of Learning, and Outcome Accountability Project (OAP) initiatives in producing an educational system on par with systems internationally by developing curricula based upon perceived twenty-first century needs and by measuring school and division productivity based on student outcomes. It is likely that innovative school scheduling practices will play a critical role as school districts and individual schools begin to restructure their programs within the framework of these initiatives. The purpose of this study was to investigate the relationship between scheduling practices and selected Outcome Accountability Project indicators in Virginia high schools. Subjects were 212 high school principals from a total of 265 high school principals in Virginia who responded to a mail survey consisting of a Scheduling Practices Questionnaire.

The evidence attained from a simple analysis of variance in this investigation supported the conclusions that there were no relationships found to exist between scheduling type and the four OAP indicators. Additionally, descriptive data revealed that since 1983 a large majority (83%) of respondents reported changes in their school schedule and that a significant number (33%) of principals reported that consideration is being given to future changes in schedule type. While it was not the primary intent of this study to investigate the relationship between location-specific factors and scheduling type, principals reported that two factors (school bus schedules and school board regulations) were deemed to be important influences on schedule development.

The practical significance of the findings is that although there tends to be little variation in present scheduling type in Virginia, there is an interest expressed by principals to change schedule type in the future. For this reason, though no relationship can presently be seen between scheduling type and student productivity, future changes may affect that finding. Also, the high rate of return and high rate of request for results of the study indicate a high degree of interest by principals in the scheduling topic.

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## Chapter I

### The Problem

#### Introduction

Scheduling practices in American schools changed very little from the establishment of the Boston Latin School in 1635 to the publication of the Report of the Committee of Ten in 1893. During that period, American schools were structured to meet the needs of a predominately rural, agrarian society. Most students attended one-room school houses, where elementary and secondary students were taught in the same classrooms. In larger communities, elementary and secondary students attended classes in different rooms of the same buildings, with the division of grades determined by the number of students at each level. But over the past one hundred years, unprecedented demographic, social, and political changes, as well as technological advancements, have spawned three periods of educational reform that have greatly affected virtually every aspect of schooling in America. These three reform periods are the developmental period, 1893 to 1959; the experimental period, 1959 to 1983; and the restructuring period, 1983 to the present (Traverso, 1984). With each new wave of reform, the practice of

scheduling the American secondary school has changed to meet the emerging educational agenda. The developmental period, which produced the first significant changes in secondary school scheduling practices, began the transition from the nineteenth to the twentieth century, when great numbers of immigrants dramatically increased the population of the nation's urban centers and separate schools were established for high school students. In 1893, in response to rapid industrialization and the pressing need for American schools to keep pace with a growing economy, the National Education Association commissioned the Committee of Ten to review all aspects of the secondary school with a special emphasis on curriculum and instruction (Sizer, 1964). The Committee was specifically charged with the responsibility to review the length of instruction both weekly and annually, to evaluate the topics to be covered, to consider subject treatment for pupils with various goals, and to identify the most effective methods of instruction and the best methods of evaluating student progress (Traverso, 1984).

The final recommendations of the Committee of Ten had a significant impact on secondary school scheduling practices. The Committee recommended that every subject taught in secondary schools be taught the same way to all pupils, regardless of their educational goals. Additionally, the Committee recommended a series of tables which suggested what the high school program would be if various time allotments were adopted by the subject-area conferences. Subjects and periods per week were suggested for each of

the four years of high school, and elective offerings were outlined. Finally, four specific "programmes" were recommended by the Committee: "Classical," "Latin Scientific," "Modern Languages," and "English." Within the context of each programme, specific subjects for study were suggested, along with the number of periods per week they should be scheduled (Sizer, 1964).

Although the Report of the Committee of Ten addressed the needs of a country experiencing rapid economic growth and demographic change, committee members could not have foreseen the dramatic changes that would occur in America over the 70 years immediately following their report. As Traverso reported, "In 1890, there were 2,526 public secondary schools in the United States which enrolled approximately 203,000 students. By 1958, the number of comparable schools had soared to over 25,500 and were educating over 7,860,000 pupils" (Traverso, 1984, p. 66). Also by 1958, technological innovation and improved modes of transportation and communication had made the world a smaller place. Democracy was meeting a major post-war challenge as communism spread throughout Eastern Europe. The United States had emerged from relative economic obscurity after the depression to establish a competitive position in the world marketplace, and a period of unprecedented prosperity had kindled a spirit of optimism throughout America. It was in response to these developments that educators once again began to question the degree to which American schools were preparing students, and the experimental period of educational reform emerged.

In 1959, James Conant's The American High School Today reflected many educators' disenchantment with education and sparked a renewed interest in revising secondary school scheduling practices. Although Conant's report was not well received by many educators, it set the stage for additional studies which ushered in a period of great experimentation in high schools across the country.

Conant's work addressed a number of important scheduling issues, including ability grouping in required courses, individualized programs, school day organization into seven or more instructional periods, and well organized homerooms (Conant, 1959). During the period immediately following publication of the book, a wide variety of new scheduling formats were introduced in high schools across the country. Among these were block, modified block and flexible-modular scheduling. As a result of educational reform and a great degree of variance in school size, American schools became laboratories for a host of innovative scheduling practices throughout the sixties and seventies.

Perhaps more significant than the actual experimentation with school schedules during this period was the acceptance among school administrators of scheduling as a viable method of improving a school's instructional program. During this period, educators began to realize the importance of time to the learning process, and, as Traverso (1984) stated, the topic of scheduling became ubiquitous on the American educational scene:

During the approximately 70 years of American secondary school education which this study has examined, there have appeared hundreds of textbooks and general reference books on either secondary curriculum or administration or both. Yet during that same period, very few books had been written which addressed exclusively the subject of secondary school scheduling. Starting in the mid-1960's, this situation changed. (p. 204)

The innovation of the sixties, however, was short lived. Although the school population continued to rise dramatically during the early years of that period, by 1976 the nation began to experience its first decline in school enrollment (Traverso, 1984). These declining enrollments, which continued through the eighties, forced many communities to close schools that had been opened just 20 years earlier to meet an increasing demand for classroom space. Perhaps more importantly, a number of critical social and economic factors contributed to the rapid erosion of public support that had undergirded the mission of public education in this country since its inception.

In A Place Called School, Goodlad (1984) cited seven major conditions in American society in the 1970's that directly influenced the nation's declining support for schools. First, two traditionally stable institutions, the home and church, were themselves in a seriously weakened condition. Second, the unquestioned supportive relationship between home and school had been diminished by an increased skepticism by parents of the school's ability to stand

in loco parentis. Third, traditional neighborhoods that had long acted as support systems for school age children had begun to disappear; students who had once been well known by their neighbors now became anonymous within their own communities. Fourth, political coalitions such as local school boards, parent groups, school administrators, and business leaders, who had once worked in harmony to advance the cause of education, now found themselves at odds, frequently working at cross-purposes. Fifth, educators became divided as to the direction that school reform should take to meet emerging student needs. Sixth, teachers began to find their classrooms filled with diverse groups of students with vastly different educational goals and little preparation for dealing with the disenfranchisement many students experienced when unable or unwilling to meet growing school expectations. And seventh, young people were receiving their schooling from a variety of sources other than the school. Teachers found themselves competing increasingly with television and the world of work for the waking hours of their students (Goodlad, 1984). It was in response to these dramatic influences that a third wave of educational reform, the restructuring period, began in 1983 with the publication of A Nation at Risk.

On August 26, 1981, Secretary of Education T. H. Bell created the National Commission on Excellence in Education. The Commission's charge was to examine the quality of education in the United States and to present its findings in the form of a national report. Although the commission was directed to study the condition of education in general, its charter directed it to pay

particular attention to high school age youth. The commission's findings were published in 1983 under the title, A Nation at Risk. The work provided the impetus for a dramatic national dialogue on the state of American education.

The national commission developed a series of recommendations in regard to content, standards and expectations, time and teaching. The recommendations under the time category have specific implications for high school scheduling. Among the commission's recommendations for use of time were increased homework for high school students; increased instruction in effective study and work skills; increased school time to 7-hour days and 200 to 220-day school year; expanded learning time at school through better classroom management and organization of the school day; development of firm and fair codes of student discipline to ensure more effective use of learning time; development of attendance policies with clear incentives and sanctions to reduce time lost to absenteeism and tardiness; reduction of administrative burdens on teaching time to add time for teaching and learning; and placement and grouping of students based on academic progress as opposed to age (National Commission on Excellence in Education, 1983).

The Commission's report began a discussion on the extent to which American high schools were preparing students for life in the twenty-first century. Since the report was filed in 1983, a plethora of additional work on the need for school restructuring has appeared in the educational literature with very specific recommendations for improving our nation's schools. Among



these recommendations has been the issue of the use of time for teaching and learning and its relationship to school effectiveness. It is this dimension of effective time use and its relationship to school productivity that is the focus of this study.

### Theoretical Rationale

Scheduling is the allocation of time, virtually the most precious resource students and teachers have at their disposal (Goodlad, 1984). More specifically, it is the process of arranging discrete learning experiences within a time frame and in a sequence appropriate to the needs of the learner and consistent with the constraints imposed on the institution (Saville, 1973). In high schools, scheduling is multifaceted in that it incorporates a variety of processes to assist in the establishment of an instructional program. Some of these processes include the assigning of teachers to courses, the assigning of courses to classrooms and periods of instruction, and the assigning of courses to the master schedule. Of equal importance are the philosophical considerations that undergird decisions made relative to scheduling, for in a very real sense the school's master schedule should be a tangible reflection of its mission statement.

If scheduling is the allocation of time for learning, then understanding the relationship of time to learning is fundamental in acknowledging scheduling as a major factor in improving instruction in individual schools. Learning as a

function of time is a subject covered thoroughly in the literature (Bloom, 1968,1974; Carroll, 1963; Dempster, 1987; Frederick & Walberg, 1980). Time is an attractive variable for researchers because it can be measured with great accuracy and consistency. As Bloom (1974) stated, "The measures of time have many properties that are almost impossible to secure in our conventional measures of academic achievement: equality of units, an absolute zero, and clear and unambiguous comparisons of individuals" (pp. 683-684). Bloom also noted that time, as a variable, can be seen in terms of economic and resource costs for the individual learner, for groups of learners, and for schools and communities. Additionally, the literature views time as wedded inextricably to the learning process (Frederick & Walberg, 1980; Dempster, 1987).

#### Statement of the Problem

The purposes of this study were twofold: a) to examine what features characterize high school schedules in Virginia, and b) to investigate the relationship between scheduling practices and Outcome Accountability Project (OAP) performances in high schools in Virginia. The features that characterize high school schedules were determined by an analysis of bell schedules received from high schools in Virginia. OAP indicators used were Objective VII-1 (11th Grade Standardized Test Scores above the 75 Percentile); Objective VII-2 (11th Grade Standardized Test Scores above Median); Objective VII-3 (Percent of Attendance); and VII-4 (Student Dropout Percentages).

### Research Questions

The following research questions will be explored in this study:

1. What features characterize high school schedules in Virginia?
2. Are there differences in high school scheduling practices based on location-specific factors?
3. Have high school scheduling practices changed since 1983?
4. If scheduling practices have not changed, are scheduling changes under consideration?

### Research Hypothesis

It is hypothesized that there is a significant difference in performance on selected variables of the Outcome Accountability Project based on the types of scheduling practices used by high schools in Virginia.

### Operational Definitions

Scheduling practices. For the purposes of this study, scheduling practice was defined as the arrangement of allocated time within a high school as indicated by the school bell schedule. Three specific bell schedule types were used: a) traditional six-period day, defined as a schedule with six periods that meet consecutively on a daily basis; b) traditional seven-period day, defined as a schedule with seven periods that meet consecutively on a daily basis; and c) block, defined as a schedule with certain classes meeting exclusively for a

period of time (eg. semester) and ending before other classes begin, or a schedule with classes meeting for different lengths of time and on different days on a rotating basis.

High school. For the purposes of this study, high school is defined as any school in the Commonwealth of Virginia containing grades eight or nine through grade twelve recognized by the State Department of Education in Richmond, Virginia and listed in the Virginia Educational Directory.

Outcome Accountability Project performance. For the purposes of this study, Outcome Accountability Project performance is defined as schools' performances on four specific Outcome Accountability Project indicators. The four indicators used in this study are under Objective VII: Educating Secondary Students: Objective VII-1 (11th Grade Standardized Test Scores above the 75 Percentile); Objective VII-2 (11th Grade Standardized Test Scores above the 50 Percentile); Objective VII-3 (Percent of Attendance); and VII-4 (Student Dropout Percentages). Indicator VII-1 is defined as the percentage of 11th grade students who took the Virginia State Assessment Program standardized test under standard conditions whose composite scores were above the national 75th percentile. Indicator VII-2 is defined as the percentage of 11th grade students who took the Virginia State Assessment Program standardized test under standard conditions whose composite scores were above the national 50th percentile. Indicator VII-3 is defined as the percentage of students in grades 9-12 who were absent 10 days or less from school. Indicator VII-4 is

defined as the percentage of students in grades 9-12 who were listed as dropouts as determined by state pupil accounting methods.

### Significance of the Study

Scheduling is fundamental to the development of a high school instructional program. No high school, regardless of its size, location, or curriculum can exist without a schedule. The primary responsibility for scheduling rests with the school principal, who must design a schedule of classes, based on a tally of student course requests, that will maximize opportunity for student learning. Educators agree that this responsibility ranks among the most important for a school principal "... for the responsible school administrator's knowledge of scheduling, or lack thereof, is the single most [sic] reason for the efficiency and success, or failure, of the opening of school each year" (Traverso, 1984, p.1).

Saville (1973) confirmed this view in his text on the instructional implications of scheduling, where he stated, "instructional programming, or school scheduling, is an important dimension of school operations, for it has a significant impact on the learner, the interaction between teacher and learner, and the methods of teaching used to promote the acquisition of a given concept or skill" (p. 2). Additionally, he suggested "a prime managerial responsibility of the school principal is the programming, or scheduling, of curricular experiences offered in his attendance unit" (p. 2). Dempsey (1988) reinforced

the significance of school scheduling by concluding "if you believe a high school's master schedule merely determines when the bell rings and classes meet, you are seriously underestimating its importance. Fact is, the master schedule has a big impact on the quality of your school program, and unless you spot problems early, a bad schedule can undermine classroom instruction" (p. 42).

The literature is replete with confirmation of the importance of scheduling (Dempsey, 1988; Saville, 1973; Traverso, 1984), but despite the undeniable significance of the scheduling process and its implications for student achievement, little research has been done to reveal the current status of scheduling practices in American high schools. This study will address that issue by assessing the current status of scheduling practices and by investigating the relationship between scheduling practices and school performance as evidenced by results on the Outcome Accountability Project (OAP) directed by the Virginia Department of Education.

#### Limitations of the Study

The following constraints limit interpretation of the results of this study:

1. The study is limited to the extent that scheduling practices may be one of a number of factors that impact on the four specific indicators chosen as dependent variables in this study.
2. This study is limited in terms of generalizability to those states that have

outcome measures similar to the Outcome Accountability Project (OAP) indicators.

3. This study is limited to the extent that it relies on the self-report of principals in regard to recent changes in their schools' scheduling practices.

### Major Assumptions

The following comprise the major underlying assumptions contained in the proposed study:

1. As a result of reform literature, school principals are beginning to rethink the way they use time for learning in their schools. As a result, schools throughout the Commonwealth of Virginia are beginning to use, or beginning to study the possibility of using, alternative forms of school scheduling.
2. Use of time is a major factor in the teaching/learning process. Since bell schedules affect the way time is allocated for learning, they have an affect on student productivity.
3. The Outcome Accountability Project of the Virginia Department of Education is a viable means of determining student learning productivity at individual state public high schools.
4. Educational administrators are becoming increasingly aware of the need to rethink present methods of delivering instruction to students. The era of school restructuring has begun and, thus, principals need information

about shifting paradigms that will enable them to use time more effectively in their schools.

5. Principals' responses to the questionnaire will be an accurate reflection of the current state-of-practice in their schools.



## Chapter II

### Review of Related Literature

#### Introduction

In this chapter, literature relating to high school scheduling, the relationship of time and learning, and education outcome indicators is reviewed. Scheduling is addressed logistically, as a managerial practice, and philosophically, as a relationship between time and learning. The development, selection, and use of education outcome indicators is addressed. Additionally, the development and implementation of the Virginia Outcome Accountability Project is reviewed. The purpose of this chapter is to provide a practical and theoretical framework for studying the relationship between scheduling practices and outcome indicators.

#### High School Scheduling

Scheduling as a managerial function. In a very practical sense the process of school scheduling is fundamental to education, for no school can

operate without a schedule. "Through scheduling, the school mingles all of its essential facets - faculty and staff, curriculum, space and facilities, students - into an integrated and efficient learning environment" (Dempsey & Traverso, 1983, p.4). But an effective school schedule does more than simply outline when and where teachers and students go to work; it defines the relationship between teacher and student in terms of intended curricular outcomes. As Saville (1973) stated, "Instructional programming, or school scheduling, is an important dimension of school operations, for it has significant impact on the learner, the interaction between teacher and learner, and the method of teaching used to promote the acquisition of a given concept or skill" (p. 2). Although educators are frequently divided on the subject of how scheduling should be performed, most agree that the scheduling process is a major responsibility of the school principal.

The principal's role in scheduling. The building principal is the one person who is in a position to bring together all of the elements of the master schedule: teaching personnel, students' course requests, space availability, time allocation, and curriculum in the formation of a schedule that will maximize instructional opportunity for students. As Dempsey and Traverso (1983) point out, that responsibility must be taken very seriously:

No "law" demands that the building principal be the scheduling administrator. Since the principal is the educational leader of the building, however, it is clearly his or her responsibility to organize

and oversee the entire scheduling process. Many of the specific scheduling duties may be delegated appropriately to assistant principals, department heads, and counselors, but the principal must direct and supervise the procedures to be followed. Decisions about the basic structure of the schedule, lengths of courses, number of minutes per course days in the cycle, number of periods per day, etc. should reflect the principal's leadership and guidance. All school persons who are affected should have a voice in these important matters, but only the principal can provide focus and direction. (p. 4)

School scheduling is a topic addressed thoroughly in textbooks designed to prepare educators for the responsibilities of the principalship. Every textbook reviewed for this study revealed a chapter on scheduling the school day. In their classic study of modern secondary schools, Edmondson, Roemer & Bacon (1941) suggested that the construction of the daily schedule is critical to the role of the building principal. They claimed that scheduling processes test the principal's vision and leadership.

In his textbook on the organization and administration of secondary schools, Douglass (1945) offered prospective principals an eight step process to scheduling that included (1) defining the offerings and curriculum, (2) estimating registrations, (3) estimating the number of class sections required, (4) assigning students to sections, (5) using the facility, (6) organizing the

school day, (7) setting the opening and closing times, (8) and setting lunch schedules.

Similarly, in another text on secondary school administration, Williams (1964), like Douglass, offered a series of steps in preparing to schedule a secondary school. These steps included (1) studying the curriculum for change, (2) gathering necessary basic information, (3) providing guidance for students and parents, (4) holding a preliminary registration, (5) preparing the master schedule, (6) checking for conflicts, (7) creating student schedules, (8) cutting the student first-day schedules, (9) and making student course changes. According to Williams' vision of the principalship, foresight in planning, a keen insight into the needs of students and the school, and the ability to prepare the schedule cooperatively with members of the staff were essential to any schedule making process.

In addition to textbooks, the issue of scheduling has been addressed in self-help books designed to provide insight for educators into the likely pitfalls of faulty scheduling practices. Ramsey (1992) suggested that "since time can be carved up in many ways, principals should examine all options for extending the daily schedule to make every minute count for learning. The easiest variables to manipulate are (1) length of class periods, (2) the number of periods per day, (3) the length and timing of lunch periods, (4) and the time before and after school, which can be converted as a means for offering optional courses of interest to students" (pp. 212-213). For Ramsey,

scheduling was not an isolated task, but a sequence of events involving a series of integrated steps that culminated in a plan for the coordination of physical, human and time resources to maximize the use of time for student learning.

The scheduling process. The process of scheduling requires a variety of sequential steps designed to ensure that the schedule created addresses the instructional needs of a majority of students. The initial phase of scheduling involves developing a tally of students' course requests, frequently called preliminary registration (Jacobson, Reavis & Longsdon, 1963). This is accomplished by enrolling students into classes. Next, the tally is reviewed and decisions are made regarding the number of sections of each course to be offered, which affects class size. These decisions are made with consideration for personnel and space availability. Once personnel decisions are finalized, the master schedule can be created using existing data. As the student tally is run against the master schedule, revisions are made to the schedule to produce the highest level of compatibility between the students' requests and the master schedule (Saville, 1973). After the process of scheduling is complete, the school principal then must decide among a number of scheduling models to determine how time will be allocated for the learning process.

Types of schedules. There are a number of different models of schedules used in secondary schools. These schedule types, depending on specific characteristics, can be viewed as traditional or flexible (Dempsey &

Traverso, 1983). Traditional schedules are characterized by daily classes of equal length and class schedules that are the same for teachers and students every day. Flexible schedules, on the other hand, are characterized by a variety of choices in time patterns for instruction and class schedules for teachers and students that may differ from day to day. Under the flexible schedule, the time allotted for different subjects may vary depending on the nature of the subject matter. Foreign language and math, for instance, which many educators believe need daily practice, might meet every day for forty-five minutes, while other courses, such as social studies and English, may meet every other day for ninety minutes. The block schedule, which is a type of flexible schedule, allows for the scheduling of classes on different days, allowing for greater time periods of instructions in fewer meetings. This format allows for the continuity of the traditional schedule in consistency of class length, but provides the flexibility of every-other-day instruction (Dempsey & Traverso, 1983).

Alternative school schedules. Although secondary schools historically have scheduled classes in traditional six- and seven-period formats, a number of alternative scheduling formats enjoyed periods of popularity, particularly during the sixties and seventies when experimentation with school schedules was a common practice (Traverso, 1984). Among the most common alternatives to the traditional school day were flexible and block schedules. Recently, due in large part to school restructuring initiatives, there has been a renewed interest in alternative ways to structure learning time in secondary

schools.

Flexible scheduling is presented favorably in the literature as an alternative to traditional scheduling. Cushman (1989) suggested use of the flexible schedule to teach required and elective course offerings together, allowing for greater levels of interdisciplinary study. Time under the flexible schedule can be used more creatively than under traditional scheduling formats. Under the flexible schedule, double periods can be established for seminar classes and time can be revised for team teaching and planning.

In the literature, flexible scheduling is seen as a positive alternative for middle schools because it enables a more relaxed climate than the traditional schedule. Lounsbury (1981) suggested that the flexible schedule is more appropriate for the middle school student than the traditional schedule because it takes into consideration the student's human growth and development needs. English & Canady (1975) presented flexible scheduling as a positive alternative to traditional time use and suggested two very specific flexible modular formats that promote opportunities for team teaching.

The literature addresses the use of flexible scheduling and its effect on student media center use. In two studies (Ohlrich, 1992; Brown, 1991), the use of the flexible schedule was seen as an advantage for the integration of media services into the regular school curriculum. The flexible schedule allowed teachers more time to access media center information and librarians greater opportunity to bring the media center resources to the student in the classroom.

The block schedule is also viewed favorably in the literature as an alternative to traditional scheduling. Canady (1990), in his work on parallel block scheduling, focused on the increased opportunity for creative time use. He suggested that block scheduling revitalizes schools by changing the paradigm and allowing for more creative staff and facility use. Teachers have greater opportunity to work with students in longer blocks of time, resulting in greater lesson continuity.

Forehand & Watkins (1979) noted the benefits of block scheduling in their report of a plan featuring twelve-week quarters with classes two and one half hours in length. The creative block schedule also allowed for an hour and twenty minutes for lunch and unstructured student time. The schedule promoted better student-teacher relationships, longer periods of instruction, and fewer classroom interruptions.

### Learning as a Function of Time

Time and educational reform. As early as 1961 in Virginia, when the Spong Commission completed a report on education for Governor Lindsay Almond, Jr. entitled Virginia Schools in the Space Age - A Continued Evaluation of the Curriculum, Teacher Training, and Related Matters, many time/learning issues were articulated by commission members. Among those were issues related to the adequacy of the length of the school day, school week and school year, given the "explosion of knowledge" in an increasingly



technical society. The commission identified a number of possible options for increasing instructional time through lengthening the school day, lengthening the school year (190 days), increasing the amount of assigned homework, increasing the time allotted to certain subjects, establishing attendance policies, and increasing graduation requirements.

In 1983, the National Commission on Excellence in Education addressed these same issues; however, they also expressed concern over the management of allocated learning time. The work of the commission suggested that time made available for learning in schools should be expanded through better classroom management and better organization.

In December of 1992, the Virginia Department of Education in its study Instructional Time and Student Learning: A Study of the School Calendar and Instructional Time reiterated the time/learning themes stated in the earlier two documents. The study's authors reported, "Educators and non-educators alike agree that the management of allocated time is of the utmost importance in assuring productive learning. School administrative and instructional practices influence the use of scheduled time for student instruction." (p. iii) Despite recommendations over three decades, little evidence exists that substantial changes have been made in the way schools manage and organize learning time.

The time/learning relationship. Scheduling is the allocation of time, virtually the most precious resource students and teachers have at their

disposal (Goodlad, 1984). And if scheduling is the allocation of time for learning, then understanding the relationship of time to learning is fundamental in acknowledging scheduling as a major factor in improving instruction in individual schools. Learning as a function of time is a subject covered thoroughly in educational literature. Time is an attractive variable for researchers because it can be measured with great accuracy and consistency. As Bloom (1974) stated, "The measures of time have many properties that are almost impossible to secure in our conventional measures of academic achievement: equality of units, an absolute zero, and clear and unambiguous comparisons of individuals" (pp.683-684). Bloom also noted that time, as a variable, can be seen in terms of economic and resource costs for the individual learner, for groups of learners, and for schools and communities. Additionally, the literature, almost without exception, views time to be wedded inextricably to the learning process.

Studies investigating the relationship between time and learning often address time in terms of years of schooling, days of instruction, hours of classes, and minutes of study (Fredrick & Walberg, 1980). Dempster (1987) indicated that time is also viewed in the literature as a multifaceted resource with each facet having distinct implications for instructional improvement. He included among these facets (a) allocated time (b) student engaged time (c) and time needed for learning. Dempster suggested that only by understanding the specific aspects of time can its influence on the instructional process truly be

understood.

Allocated time. To the extent that time is a necessary ingredient in the learning process, the allocation of time for learning becomes an important and extremely measurable variable for researchers. Allocated time is significant because it is a variable over which teachers and school administrators have some direct control. Allocated time research is frequently descriptive in nature, tracing variations in the way teachers apportion time for learning. Occasionally it is correlational, defining a time-learning relationship (Smith, 1978). An evaluation of allocated time research produces mixed findings, yet the topic continues to be a significant area for discussion among educators.

A review of allocated time research discloses a variety of findings. Studies on reading achievement (Taylor, Fry, & Maruyama, 1990) and social studies achievement (Smith, 1978) of fifth grade students revealed little or no relationship between allocated time and learning. But other studies (Fischer, Filby, & Marliave, 1979; Kidder, Kiesling, & O'Reilly, 1975; and Husen, 1972) found a strong relationship between the two variables. Wiley & Harnischferger (1974) found that increases in allocated time dramatically increased student gains. They suggested that increasing the length of the school year, increasing the length of the school day, and increasing rates of student attendance could have a significant effect on student achievement.

In all, the literature on allocated time research has produced enough support for one researcher to conclude that "... evidence about the allocated

time-achievement nexus seems to be consistent enough for schools to carefully consider the methods and strategies they have to assist teachers in examining their allocations of in-class time to competing curricular areas, and to students who compete for the precious commodity of teacher attention" (Smyth, 1983, p. 131).

Levin (1984) found the above contention to be correct. Allocated time creates the opportunity for learning. Total time allocated for learning is a critical factor and positively correlates to student achievement. Quality of time is important; however, an inadequate amount of time allocated will undermine even the best quality instruction.

Increased allocated time for learning appears to offer advantages for students who are behind in their learning and who are at risk for failure. Karweit (1988) reports that significantly increasing the amount of time allocated to certain preprimary programs results in increased achievement, particularly for at-risk students. Although these gains are only short term, results consistently indicate that increased time allocated for instruction benefits students who are at risk for failure.

Since increased time allocated for learning appears to correlate to increased student achievement, a frequent theme in educational research is to investigate alternative ways to add time for student learning. Three specific recommendations found in the literature include (a) lengthening of the school day, (b) lengthening the school year, and (c) strengthening the summer school

program. A survey on the research on the extended school day reveals mixed reports. Wheeler (1987) found a positive correlation between length of school day and achievement scores. Similarly, Harrison and McEachern (1989) found that students participating in full-day first grade programs had significantly higher reading scores than their half-day counterparts. Karweit's (1988) study with kindergarten students seemed consistent with those findings, particularly in regard to at-risk students. On the other hand, Hossler, Stage & Gallagher (1988), while finding small but positive gains as a function of increased learning time, concluded that the relationship between time and achievement is not strong. In fact, some studies reveal that increased learning time may hinder student learning.

The work of two researchers (Karweit, 1985; Walberg, 1988) indicates that simply increasing learning time may not be sufficient. Increasing the length of the school day and the school year may promote absenteeism, which may actually inhibit the continuity of classroom instruction. Additionally, increasing learning time may increase learning fatigue. In reality, in lengthening learning time students may reach a point of diminishing returns, a time when learning gains diminish as time increases.

Extended school day. The school day in Virginia is approximately five and one-half hours in length and is predicated on schooling during the daylight hours. Parents prefer to have their children transported to and from school during daylight for safety and security reasons. Because long bus rides often

infringe on the amount of time available for instruction, school administrators have been reluctant to add time to the school day for fear of increasing student stress and fatigue.

The research is mixed on the benefits of extending the school day. One study (Hossler, Stage & Gallagher, 1988) revealed no evidence that an extended school day increased student learning. Other studies (Harrison-McEachern, 1989; Karweit, 1988; and Wheeler, 1987) found significant increases in student learning with the extended day, particularly in regard to kindergarten and first grade students and students at-risk.

In Virginia, standards for the length of the school day are set by the Department of Education and are stated in Standards for Accrediting Public Schools in Virginia (1988). The time standards presently are five and one-half hours for grades 1-12 and three hours for kindergarten. Local school divisions may apply for a waiver of the time standards under certain circumstances as specified in the Board of Education's regulations governing alternative education.

Extended school year. Extending the school year is another option for increasing learning time. As with the extended day, there are divergent views on the benefits of adding learning time in this fashion. The length of the school year varies internationally from a low of 160 days in Belgium to a high of 240 days in Japan (VDOE, 1992). But these figures can often mislead. For instance, many of the 240 days Japan claims as school days are used for field

trips, extra-curricular activities, and half-day instruction. Actual full-time instructional days in Japan number 195, only fifteen days more than standards typically found in the United States (VDOE, 1992). Also, different countries have different levels of educational heterogeneity in regard to inclusion of students into educational programs. Asian countries, for example, lack the cultural diversity of the United States. The United States values education for all its citizens regardless of race, social or economic status, or ability level. Comparisons of educational productivity, then, as a function of number of school days may be misleading.

Research on the benefits of lengthening the school year cites little to be gained by adding days of instruction. Levin (1984) found that no strong evidence existed to support the contention that increasing the number of days would appreciably improve student learning and, in fact, suggested that it would not be cost effective. Hossler, Stage, & Gallagher (1988) found no controlled studies on the topic. They concluded that while increasing the number of days students attended school might slightly increase learning, no strong relationship between increased allocated time and learning could be found.

Summer tuition program. Summer school presents a third option for allocating more time for student learning. Strengthening the summer program affords educators the opportunity to expand learning time without changing the configuration of the traditional school day. Summer sessions, which are usually tuition programs offered for remediation, promotion, enrichment and

acceleration, were initially designed to help halt the regression that occurs in student learning with the summer recess from school. In reality, although a slight amount of regression actually occurs, it stems more from a lack of practice than from forgetting. (VDOE, 1992). A review of the literature on summer tuition programs as effective ways to allocate additional learning time is mixed. Ascher (1988), in his review of summer school literature, found that little significant educational benefit occurs for the learner when the summer tuition program is used to halt regression in learning. On the other hand, Tiller, Cox & Stayrook (1986) found that for children with severe disabilities summer special education programs slowed learning regression. For most children with disabilities, however, learning regression was comparable to the general population.

Management of allocated time. A number of other factors impact on the use of allocated time for learning in schools. For school divisions, decisions regarding the number and arrangement of inservice days, teaching days, holidays, parent conference days, senior dismissals, and local elections all impact on allocated time. At the school level, the bell schedule, field trips, assemblies, fire drills, lunch schedules, class transitions, activity periods, homeroom periods, and lunch schedules all impact on allocated time (VDOE, 1992). The way school administrators manage time, then, is a critical factor in understanding the relationship between time and learning. The statement below taken from the Virginia Department of Education (1992) report on time



and learning reinforces this point:

Despite efforts to increase time-on-task and student learning, there remains a high degree of variability in instructional and administrative practice related to the management of allocated time. Survey results indicate there is a wide diversity among Virginia school divisions in scheduling other than classroom school activities. Comments from local educators suggest that many divisions have begun to evaluate their use of scheduled time and the relationship between time and student learning. However, there is no evidence of a statewide focus on management of allocated time.

Educators and others agree that the management of allocated time is of the utmost importance in the assuring of productive student learning. School administrative and instructional practices influence the use of scheduled time for student instruction. Practices that foster student effort and match student learning needs with the instructional task enhance student productive learning. (p., 73)

Engaged time. Engaged time refers to the time students spend actively involved in learning activities. A variety of factors affect the degree to which students are attentive and on-task. Among these are motivation, self-concept, peer group pressure, achievement level, learning style, instructional needs,

developmental level, quality of instruction, physical condition and class size (VDOE, 1992). Karweit (1988) found that students vary in their on-task behaviors, sometimes by as high a ratio as three to one. Most researchers agree that the student's orientation to learning is the single most important factor in the percentage of time spent engaged.

Since the fifties, research on engaged time has revealed that the time pupils spend actively engaged in learning activities is predictive of achievement. Bloom (1974) found that pupil engagement accounted for as much as 20% of the variation in their achievement. Further studies revealed that levels of instruction and ability levels of students were additional variables relevant to the association of engaged time and student achievement.

Time needed for learning. The concept of time needed for learning finds its roots in the work of John Carroll (1963), whose early research provided the impetus for much study into the relationship between time and learning. Carroll, recognizing that learning in schools took place in fixed-time conditions, suggested that achievement would increase if intended outcomes instead of fixed-time were emphasized. Bloom (1968), building on Carroll's research, developed the concept of mastery learning, "... which relies heavily on the provision of extra time (and more instructional help) so that students can overcome errors and misunderstandings identified by frequent, short, and highly valid measures of student learning." (Anderson, 1983, p. 3) For effective mastery learning to occur, then, there must be a clear delineation of the

intended outcomes, frequent assessment of student performance relative to the definition of mastery, and sufficient time (including additional time for students who initially do not attain mastery) for students to achieve mastery (Anderson, 1983).

Gettinger (1987) estimated time required by fastest and slowest learners in a variety of settings. Her research indicated that students ranged from 1 to 60 days in the amount of time needed to complete an assigned unit. Walberg (1988) found that when a view of elapsed times by fastest to slowest learner to reach criterion performance in ordinary classrooms were calculated, different studies revealed variations from 1:7 to 7:1.

### Education Indicators

Development of education indicators. For years schools and school divisions have been accredited based on standards designed to account for tangible commodities thought to impact on educational success: classrooms, library books, physical education equipment, etc. Recently, interest has shifted from educational inputs to educational outcomes. Throughout the country, legislatures and state boards of education are beginning to require annual profiles intended to draw public attention to the performance of individual schools and school divisions and to provide information and data for educators to facilitate school improvement.

A survey conducted by the Southern Regional Education Board in 1992

revealed widespread use of accountability measures throughout the southern states beginning in 1990. Florida and South Carolina (1990) were among the first to report by individual schools, with Alabama, Louisiana, Mississippi, Texas, and West Virginia (1991) close behind. Maryland, Oklahoma, and Virginia followed in 1992. In most instances, these accountability measures were the direct result of legislation passed at the state level (Gaines & Cornett, 1992).

While most states have begun to generate initial sets of school performance data, the new emphasis has been on refining existing outcome measures to produce information that can accurately depict levels of individual school and division performance. Due to the newness of the concept, a great deal of experimentation can be found in outcome accountability projects throughout the country. This experimentation has caused some variation in measures used to assess the school and division productivity.

A number of studies traced the early development of education indicator programs throughout the country. Several studies (Bryk & Hermanson, 1993; Bush, 1990; Rothman, 1993; Shriner & Others, 1992) viewed the national development of education indicators, comparing how states assessed needs, organized indicators, determined program assessment procedures and actually initiated education indicator programs. Research was also conducted to describe how individual states, such as Pennsylvania (Cooly et al., 1992), Rhode Island (Cooper, 1991), Arizona (Danzig, 1990), Louisiana (Franklin & Crone, 1992), and Colorado (Hennes & Petro, 1992), to name a few, have

addressed the initiative. Research focusing on the development of education indicator programs in rural districts (Fabert & Homlish, 1988) and urban districts (Darling-Hammond & Ascher, 1991) have been covered as well.

A number of subject area councils have reviewed the education indicator initiative in an effort to establish standards for individual subjects consistent with national, state and local efforts. Among the subject areas included are social studies (Center for Civics Education, 1992), science (National Committee on Science Education Standards and Assessment, 1993), English (National Council of Teachers of English, 1993), and fine arts (National Endowment for the Arts, 1992).

Selection and use of education indicators. An investigation of the different education indicators used by Southern Regional Education Board (SREB) states revealed that all participating states assess nationally normed test results, SAT and ACT results, and the results of state testing programs. Additionally, some SREB states measure attendance rates, dropout rates, graduation rates, along with several other measures. How these results are measured, however, differs from state to state. For instance, in Virginia, nationally normed tests are assessed by the percent of students in grades 8 and 11 scoring above the 25th, 50th, and 75th percentiles and the percent of students in grade 4 scoring above the 25th and 50th percentiles. In South Carolina nationally normed tests are assessed by number of students tested, scores, percent above the 50th percentile, percent at or below the 25th

percentile, and percentile rank by sub-test for grade 7 (Gaines and Cornett, 1992).

Researchers have studied the selection and use of education indicators nationally and internationally. Two studies (Nuttall, 1991; Porter, 1991) reviewed the importance of choosing the correct education indicators. Nuttall (1991) examined factors that influence the selection of specific indicators as part of an overall program. In the study, a number of important interacting factors that influence indicator development were described. They included policy, technical and practical considerations, along with research knowledge. Porter (1991) argued for the inclusion of process indicators. In the study, a model of school processes were described and a number of corresponding indicators were suggested.

Many questions exist regarding how education indicators should be used. Boe (1992) presented a view of indicator systems used as incentives and/or disincentives to encourage local school districts to improve instructional practices. In the study, incentives and disincentives were distinguished from reward, punishment, sanction, and penalty, and some of the existing examples of incentives and disincentives in education were given. Shavelson, McDonnell, & Oakes (1991) offered a view of what education indicators should and shouldn't do. They contended that education indicators should monitor education outcomes and reflect the unique characteristics of the communities they are designed to monitor. Education indicators should reflect the current

state of the curriculum and instructional program, as well as the culture of the school.

Data collection and verification. States differ in the way they collect and verify data. Because there is an initiative to collect individual student data, many states are investing in management information networks for use in compiling student information. Some states, such as Florida and Texas, have already developed statewide systems for student information management. Other states, like South Carolina, collect student data compiled by school districts, but the state system does not include individual student records in its reports.

However student information is collected, the need for accuracy and systems of data verification is evident. Accuracy of information reporting is critical because unless procedures are consistent from school to school and from division to division, true value of performance cannot be measured. Having school data reported accurately is vital. When certain measures that involve relatively few members of a student population (such as dropout rate) are studied, a minor error can dramatically shift the rate for the entire school. Similarly, reports should show results for different groups within schools, including information by race/ethnicity and gender. This more specific data can help to clarify the nature of inequities that can frequently be hidden behind larger groups of less clearly defined school-wide data (Gaines & Cornett, 1992).

Assessing the education indicator initiative. The research includes studies that assess the work to date in establishing education indicator systems throughout the nation. Much of the literature centers around concern over the ability of educators to select and measure indicators that will truly reflect educational needs. Cohen & Spillane (1991), in a paper presented to the General Assembly of the INES Project, questioned the assumption that education indicators will improve decisions made about teaching. They express concern with selection and design procedures and with the degree to which indicator selection should be predicated on location-specific factors as opposed to general educational expectations. Broadfoot (1991), in a paper presented before the same assembly, addressed the challenges of defining and measuring indicators that reflect a broad range of educational goals. The failure to do so would generate an abundance of inappropriate information upon which educational theory would be based.

Eraut (1991), in yet another paper presented before the General Assembly of the INES Project, focused on the indicator system as a means to greater accountability in education. The paper addressed concerns about having indicator data available at all levels of the educational process and enfranchising classroom teachers in the selection and evaluation process so they will have confidence that chosen indicators reflect accurately what students have learned. Concern about the proper interpretation and use of education indicator data was expressed as well.



### National and global implications of outcome based assessment.

Although the information above reflects the outcome-based education movement in the southeast region of the United States, interest is actually widespread. Implications for improved school effectiveness are global. Just as the United States struggles with the debate over meritocratic versus democratic student assessment (Cooper, 1992), which is the need to balance high student productivity and equal educational opportunity, so do nations throughout the world. Outcome-based measures can be found in educational communities across the globe as well as across the country. In America, a number of states such as Maine, Rhode Island, Vermont, Michigan, and New Mexico have developed projects for measuring student, school and division outcomes. Although the specific criteria measured and assessment methodology used may differ from state to state, each reflects the need to begin the process of quantifying the educational productivity of the nation's schools.

### Virginia's Outcome Accountability Project

Development of Virginia's Outcome Accountability Project. In 1986, the Governor's Commission on Excellence in Education recommended that the Commonwealth focus on student outcomes as a means of ensuring accountability and stimulating school improvement statewide. The concept of outcome accountability was established through the Standards of Quality in 1988, the same year the Board of Education in Virginia endorsed the state role

in developing an outcome accountability system for public schools.

The initial phases of the Outcome Accountability Project were conducted by the Department of Education and Virginia Commonwealth University. Additionally, a broad cross-section of the education community was included to provide input and guidance on program development issues. The first school division reports were received in 1991. The 1992 reports represent the second year of information on school divisions, and include first year data on individual schools. The project will continue to evolve as a part of the Department of Education's World Class Education initiative (Interpretive Guide to Reports, 1992).

Purpose of the Outcome Accountability Project. The Outcome Accountability Project was established as a part of the World Class Education initiative of the Department of Education. Its main purpose is to provide information to the Commonwealth, school divisions, and individual schools in regard to the progress of students on specific outcome indicators. These indicators measure certain competencies and abilities viewed by the Department of Education as critical to student success as defined by the Common Core of Learning and other components of the World Class Education initiative (Interpretive Guide to Reports, 1992).

The Outcome Accountability Project reports have been designed to assist educators in evaluating the progress of students, in recognizing schools for their progress and achievement, and in using available resources more effectively.

The reports have not been designed as a diagnostic tool, but to serve as a broad indicator of the state's educational condition.

Outcome indicators. The Outcome Accountability Project indicators measure performance across various student populations and are designed to provide a broad view of how students in the Commonwealth are performing. The Interpretive Guide to Reports (1992) outlines the following criteria for outcome indicators:

1. represent the Goals of Public Education, established by the Virginia Board of Education;
2. provide a balance of quality and quantity (e.g., including both SAT scores and percentage of students taking the SAT);
3. focus on leading indicators in the K-12 program, and avoid the overuse of test scores; and
4. focus on performance and progress of minority students. (p. 5)

Outcome indicators are organized according to seven objectives designed to provide information on individual school and school division performance. The seven objectives stated by the Virginia Department of Education's Outcome Accountability Project include:

- I. Preparing Students for College;
- II. Preparing Students for Work;
- III. Increasing the Graduation Rate;
- IV. Increasing Special Education Students' Living Skills and

Opportunities;

- V. Educating Elementary School Students;
- VI. Educating Middle School Students;
- VII. Educating Secondary School Students.

For the purpose of this study, Indicator VII is being used.

#### Summary of the Review of Related Literature

Although the scheduling process is primarily a managerial function, the creation of a school master schedule has significant instructional implications for student achievement. A review of the literature on school scheduling reveals a process fundamental to effective school operations. Almost without exception, the scheduling process is seen as a primary responsibility of the school principal; although responsibility for the schedule may be delegated, the principal is responsible for providing focus and direction. The scheduling process involves a series of integrated steps, beginning with course registration and ending with the creation of a master schedule. Schedules tend to fall into one of two categories: conventional or flexible.

Throughout the educational literature, learning is seen as related to time. Researchers have investigated time allocation, engaged time, and time needed for learning. Time allocation is the amount and sequence of time allotted to learning; engaged time is the amount of time students actually spend on task learning; and time needed for learning is the amount of time needed for an

individual student to master a concept being taught. The literature on allocated time revealed a wide range of findings; however, most researchers found a correlation between increased learning time and achievement. Educators have suggested increasing allocated time by (a) extending the school day, (b) extending the school year, (c) and instituting summer school programs.

The Outcome Accountability Project is a program of the Department of Education in Virginia as part of an international education indicator initiative. Much research has been conducted on the efficacy of education indicators as a means to improving the quality of schooling through increased accountability. Research has been conducted tracing the development, selection, use and assessment of education indicators.

The Outcome Accountability Project was established in 1988 as a part of the World Class Education (WCE) initiative and was designed to measure the productivity of schools and school divisions in the Commonwealth of Virginia. The OAP is divided into seven major objectives, with each objective subdivided into specific performance indicators, four of which have been chosen as the dependent variables for this study.

## Chapter III

### Methodology

#### Introduction

This chapter presents descriptions of the sample involved in this study, the instrumentation, and the method of data collection. Statistical hypotheses, and the procedures for analyzing the data are also presented. This study of the relationship between scheduling practices and student productivity was based upon a causal-comparative methodology which:

is aimed at the discovery of possible causes for a behavior pattern by comparing subjects in whom this pattern is absent or present to a lesser degree. This method is sometimes called *ex post facto research*, since causes are studied after they have presumably exerted their effect on another variable....Interpretations of causal comparative findings

are limited because the researcher does not know whether a particular variable is a cause or result of the behavior pattern being studied. (Borg, 1983, p.533)

The independent variable. The independent variable for this study is scheduling type. This is operationally defined as being represented by variations of the schedule: sixth period, seventh period, or block.

The dependent variables. The dependent variables for this study are the four performance indicators taken from the Outcome Accountability Program. These are operationally defined by use of four indicators under area seven: VII-1 (students performing at or below the 75th percentile on the state's standardized achievement test given at grade 11), VII-2 (students performing at or below the 50th percentile on the state's standardized achievement test given at grade 11), VII-3 (percent of students with 10 days or less absent), and VII-4 (percent of dropouts).

This study is designed to investigate the relationship between scheduling practices and Outcome Accountability Project performance in high schools in Virginia. In addition, characteristics of high school schedules, recent (since 1983) changes in scheduling practices in high schools, and relationships between scheduling practices and selected demographic characteristics of school divisions were explored.

### Research Questions

The following research questions were explored in this study:

1. What features characterize high school schedules in Virginia?
2. Are there differences in high school scheduling practices based on location-specific factors?
3. Have high school scheduling practices changed since 1983?
4. If scheduling practices have not changed, are scheduling changes under consideration?

### Null Hypothesis

The following specific null hypothesis was tested:

There are no significant differences ( $p < .05$ ) in Outcome Accountability Project performance based on the types of scheduling practices used by high schools in Virginia.

### Sample and Accessible Populations

Sample size. The sample population for this study were high schools in Virginia. A request for the school bell schedule and a scheduling practices questionnaire were sent to all 265 Virginia high school principals as indicated in the 1992 Virginia Educational Directory published by the Virginia Department of Education in Richmond, Virginia. Because the full population of high schools in Virginia were included in the study, sampling procedures were not employed.



To ensure that the scheduling practices questionnaire was completed by appropriate school personnel, a request that the survey be forwarded to the administrator primarily responsible for scheduling was included in the cover letter.

Generalizability. Results of the study are intended to be generalizable to include all public high schools in Virginia. To a lesser extent, the results also may be generalizable to all public high schools throughout the United States in states where accountability measures such as the Outcome Accountability Project have been instituted.

### Instrumentation

Scheduling Practices Questionnaire. A review of related studies revealed no adequately validated survey instrument for use in this study; therefore, a survey was developed by the researcher to gather necessary data on current high school scheduling practices. Survey questions were generated from a variety of sources, including the researcher's review of the literature regarding scheduling practices. The questionnaire was used to complement the school bell schedule that was requested from each respondent. Once high school schedules were received, they were reviewed and categorized by schedule type. The information included on the questionnaires placed into context factors that impact on the development of bell schedules in the state and helped clarify the degree to which school administrators in Virginia are

changing the way time for learning is allocated in their schools.

The Scheduling Practices Questionnaire was designed to complement the bell schedule information that was requested from each respondent. Although most data needed to evaluate current high school scheduling practices were generated by the researcher's evaluation of requested bell schedules, data which could not be gleaned from bell schedules but which were needed for addressing stated research questions were collected using the scheduling practices questionnaire. The questionnaire included the following questions:

1. "How long have you been principal at this school? "
2. "In your division, does the principal have discretion over the bell schedule."
3. "Has the school bell schedule changed since 1983?
  - a) If yes, please state when and explain why the schedule changed.
  - b) If no, but a schedule change is being considered, please explain why."
4. "Are there any demographic factors that affect the bell schedule at your school?"
5. "The bell schedule you attach to this questionnaire will be reviewed and categorized. In the space provided below, address specific features of your bell schedule that may need clarification."

Before inclusion in the questionnaire, all potential questions were reviewed by 5 high school administrators. The final questions used were edited

based upon their suggested revisions. Their suggestions were helpful in the development of the list of location-specific factors in item 4 above.

Demographic and Outcome Accountability Project data. Demographic and Outcome Accountability Project data were received from selected Virginia Department of Education reports. The data source for Objectives VII-1 and VII-2 was the Virginia State Assessment Program data tape; the data sources for Objective VII-3 and VII-4 respectively were the listings of self-reported attendance figures and dropout figures sent by schools to the Virginia Department of Education as mandated by the Virginia Department of Education's "Superintendents Administrative Memorandum No. 52."

#### Data Collection Procedures

Data collection from schools. Data were collected from each participant by way of a returned bell schedule and Scheduling Practices Questionnaire. A cover letter and questionnaire were mailed to prospective respondents on January 18, 1993. A stamped, self-addressed return envelope was also provided, and respondents were asked to return the requested materials within two weeks (February 2, 1993). A follow-up contact was made through a second mailing to non-respondents made on February 18, 1993. All participants were assured of confidentiality. A minimum acceptable response rate of at least 70% was set and considered adequate for this study.

Data collection from the Virginia Department of Education. Demographic

and Outcome Accountability Project (OAP) data were requested from the Virginia Department of Education, Division of Information Systems.

### Data Analysis

Data analysis for research hypothesis. Data were analyzed using descriptive statistics to determine measures of central tendency (mean) and variability (standard deviation). Percentages and frequency indexes were used to describe the dependent variables (OAP performances) and their relationship to the independent variable (scheduling practices). Mean scores by level of OAP performance were obtained for each type of schedule.

The one-way analysis of variance (ANOVA) statistical technique was used to determine whether mean scores among the different scheduling practices categories surveyed differed significantly from each other regarding levels of performance on Outcome Accountability Project indicators. Levels of significance were set at the ( $p < .05$ ) level of confidence. The completed data was statistically analyzed through the use of SYSTAT 3.2 (Systat, Inc., 1988).

Data analysis for research questions. Research questions were analyzed using data received from school bell schedules and Scheduling Practices Questionnaires. Counts and percentages were computed on the initial spreadsheet (Excel 4.0, Microsoft, 1992). Schedules were categorized into one of three schedule types: sixth-period day; seventh-period day; and

block. These data received from respondents allowed the researcher to determine what features characterize schedules in Virginia high schools. Additional questionnaire information allowed the researcher to determine whether demographic factors affected how bell schedules were constructed, and whether or not bell schedules have changed since 1983.

#### Ethical Safeguards and Considerations

This research design elicits responses that can be measured empirically. The data were translated into statistical units so that they could be interpreted by consumers of educational research. The research design is ethical in terms of its use of human subjects in that all data collected reveal division or school behaviors as opposed to the behaviors of specific individual respondents. In reporting results, only statistical summaries of responses were utilized. The identity of no individual respondent or school district was divulged or reported. These procedures are in keeping with acceptable research practices as determined by the Human Subjects Review Committee.

Subjects participating in the survey had the opportunity to request results. Additionally, the results will be made available to division superintendents and high school principals in Virginia, as well as to State Department of Education administrators and interested college and university personnel across the state.

## Chapter IV

### Analysis of Results

It was the intent of this study to examine features that characterize high school schedules in Virginia and to investigate the relationship between school scheduling practices and certain Outcome Accountability Project indicators in Virginia high Schools. A mail survey consisting of a Scheduling Practices Questionnaire was administered to all 265 high school principals in the Commonwealth of Virginia as indicated in the 1992 Virginia Educational Directory.

A total of 216 principals of the 265 surveyed completed and returned the instrument, which represents a return of 82%. Of the 216 instruments received, four were incomplete, and therefore discarded. Useable returns totaled 212 or 80%.

The 212 schools represented by the respondents ranged in student membership from the smallest at 203 pupils to the largest at 2,866 pupils. Average membership was 1055 students, and the median school enrollment was 934. According to Table 1 slightly more than half of the high schools in Virginia have less than 1,000 students in membership. Percentages

approximate those of the actual population.

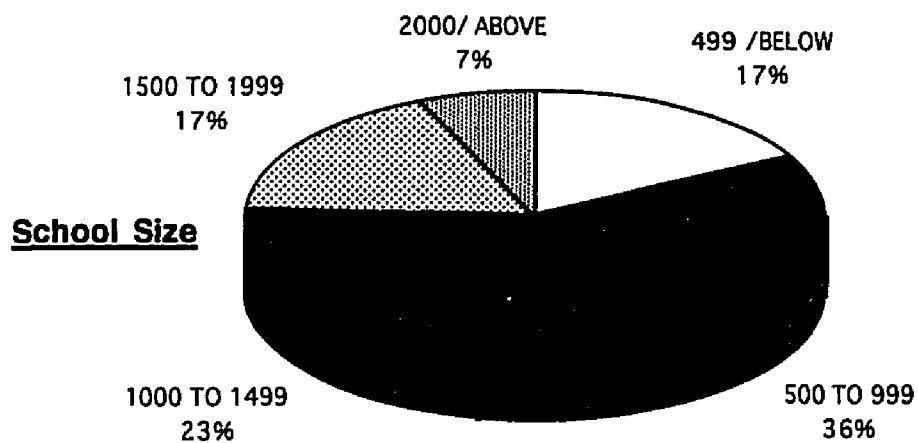
### Demographic Data

Principals responding to this questionnaire varied in length of service to their schools from one to 28 years. As shown in Table 2, 122 principals, or 57%, have been at this position four or fewer years. Only 13 principals, or 6%, have been at their present schools for 16 years or longer.

Table 1

### Demographic data

Category	Range	No.	Percentage	Population	Percent of Population
School Size	499--below	36	17.06%	47	17.73%
	500--999	77	36.49%	96	36.23%
	1000-1499	48	22.74%	61	23.03%
	1500-1999	36	17.06%	45	16.98%
	2000-above	14	06.63%	16	06.03%
* Total		211	100 %	265	100 %
* One school not reporting fall membership					

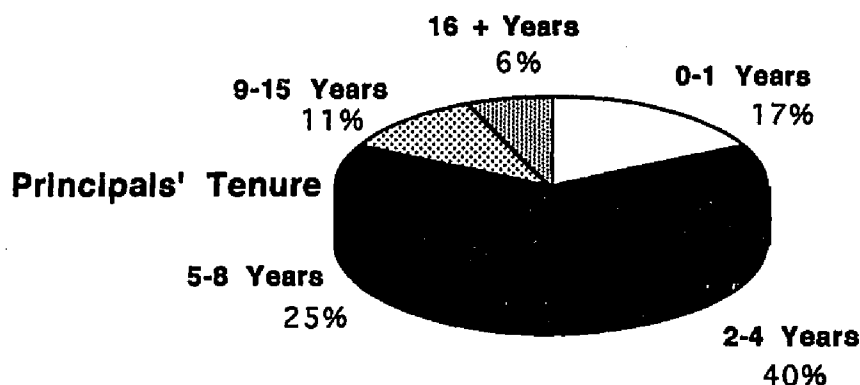
**Figure 1****Table 2****Principals' Tenure**


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Descriptive Category	No.	Percentage
0-1 Yrs.	37	17.45%
2-4 Yrs.	85	40.09%
5-8 Yrs.	54	25.47%
9-15 Yrs.	23	10.85%
16 or More Yrs.	13	06.13%
Total	212	100%

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**Figure 2**

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### Analysis of Research Questions

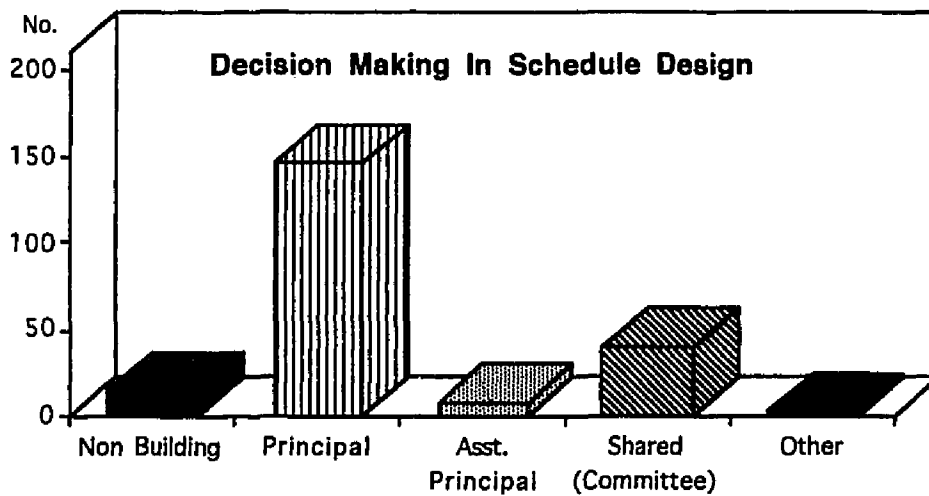
Which features characterize high school schedules? Little variation exists in school schedule types. Seven-period schedules (n=156) accounted for nearly 75% of the schools surveyed. Twenty-four percent (24%) of the principals (n=51) reported having six-period schedules. Only two percent (2%) of the respondents (n=5) reported using block schedules.

One hundred ninety-seven, or 93% of the principals responding, reported they had discretion in the design of their school schedules. As indicated in Table 3, 147 principals, or nearly 70%, personally design their school schedules.

Table 3

Decision-making in schedule design

Descriptive Category	No.	Percentage
Non-building	15	07.07%
Principal	147	69.33%
Assistant principal	8	03.77%
Shared (committee)	40	18.86%
Other	2	0.94%
Total	212	100%

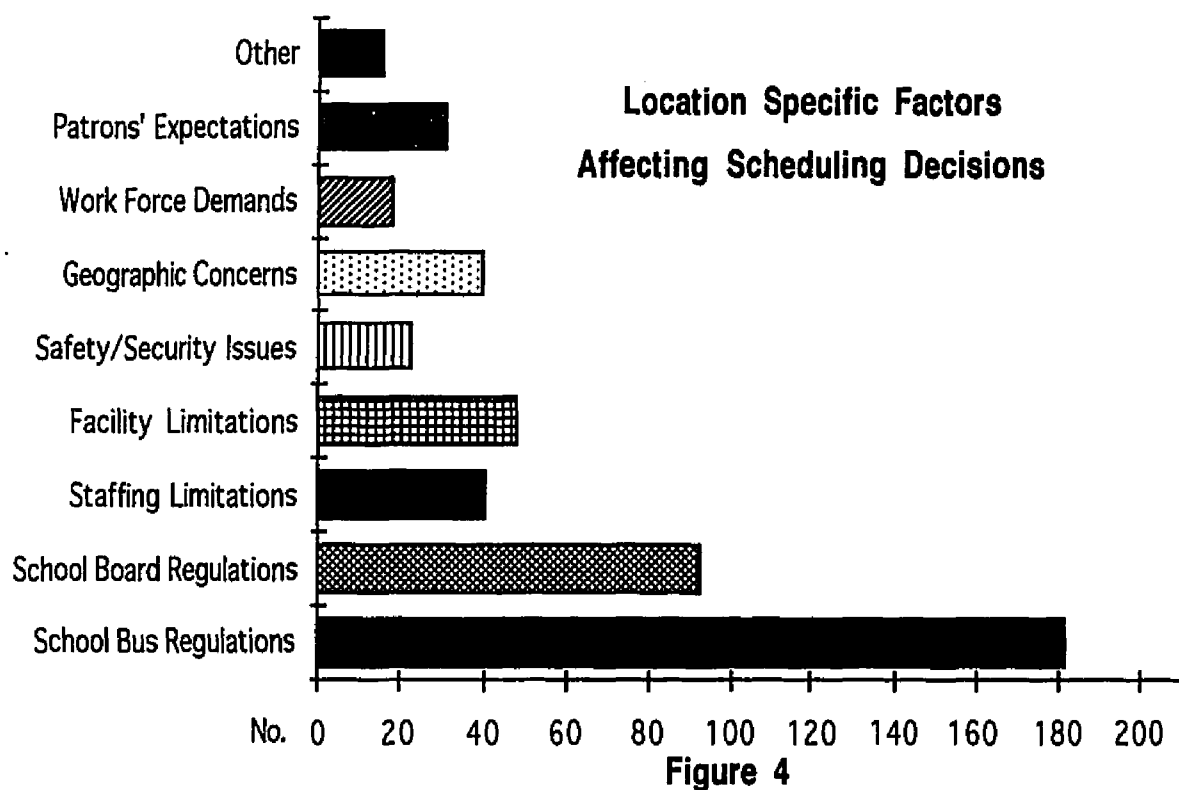
**Figure 3**

Are there differences in high school scheduling practices based on location-specific factors? Principals reported a number of location-specific factors that affected scheduling decisions. Primary among these factors were school bus schedules, identified by 182 administrators or 86% and school board regulations, identified by 93 principals or 44%. No other item was identified by more than 23% of those responding. Sixteen principals, or seven percent, responded to the item labeled "other." Narrative remarks indicated a need to adjust school schedules to coordinate with regional technical schools.

Table 4

Location-specific factors

Factor	No.	Percentage
School bus schedules	182	85.85%
School board regulations	93	43.87%
Staffing limitations	41	19.34%
Facility limitations	49	23.11%
Safety/security issues	23	10.85%
Geographic concerns	40	18.87%
Work force demands	18	08.49%
Patrons' expectations	31	14.62%
Other	16	07.55%



Have high school scheduling practices changed since 1983? According to principals surveyed, 176 schools, or 83%, have changed their school schedules since 1983. Predominantly, schedules were changed from 6 to 7 period days to accommodate increased graduation requirements.

Are scheduling changes under consideration? Of all schools surveyed, 75 (36%) indicated that they were considering a change in schedule for the next term. Thirty-two of the 75 expressed an interest in developing a block format.

### Analysis of Hypothesis

Descriptive data. Descriptive statistics are reported in Tables 5 and 6 for the continuous scores of the four dependent variables: O1 (OAP indicator VII-1, 11th grade standardized test scores above the 75 percentile); O2 (OAP indicator VII-2, 11th grade standardized test scores above the 50 percentile); O3 (OAP indicator VII-3, students with 10 days or less absent); O4 (OAP indicator VII-4, student dropout percentage).

One outlier school from the block schedule group produced exceptional standard deviations for variables O1 and O2. Once the outlier block schedule was omitted from the analysis, standard deviations for variables O1 and O2 closely matched the other two schedule types.

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Table 5

#### Descriptive statistics for four dependent variables

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Total observations: 212

	O1	O2	O3	O4
N of cases	212	212	212	212
Minimum	05.10%	26.30%	13.00%	0.12%
Maximum	100.00%	100.00%	95.00%	18.60%
Range	94.90%	03.70%	82.00%	18.48%
Mean	30.57%	58.14%	57.84%	4.42%
Variance	182.691	177.777	188.129	6.896
Standard dev	13.516	13.333	13.716	2.626
Std. error	0.928	0.916	0.942	0.180
Sum	6479.700	12325.100	12261.000	936.510

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Table 6

Descriptive statistics for four dependent variables by schedule type

Total observations: 212

Type	Variable	No.	Mean	Standard Deviation
6th pd.	O1	51	30.535	10.752
	O2	51	57.871	13.771
	O3	51	58.354	16.862
	O4	51	04.480	03.141
7th pd.	O1	156	29.958	13.376
	O2	156	57.577	13.602
	O3	156	56.848	13.250
	O4	156	04.435	02.435
Block	O1	5	40.700	35.669
	O2	5	64.360	23.471
	O3	5	70.440	11.541
	O4	5	03.234	02.974

ANOVA results. The second stage of data analysis consisted of subjecting the variables to an analysis of variance (ANOVA). An alpha level of  $p < .05$  was chosen as the level of significance to protect against a Type I error.

**Hypothesis 1.01:**

There is no significant difference ( $p < .05$ ) in Outcome Accountability Project performance (VII-1, 11th grade standardized test scores above the 75%) based on the types of scheduling practices used by high schools in Virginia.

Analysis through use of the ANOVA technique yielded no single probability less than .05 (Table 7). Hypothesis 1.01 was therefore not rejected for the dependent variable O1 (Indicator VII-1, 11th grade standardized test scores above the 75%).

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**Table 7**

**ANOVA on first dependent variable-O1**

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OAP--VII-1

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Source of variance	SS	df	MS	F	Level of Significance
Between groups	0.376	1	0.376	0.002	0.964
Within groups	38547.409	210	183.559		
Total	38547.785	211			

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## Hypothesis 1.02:

There is no significant difference ( $p < .05$ ) in Outcome Accountability Project performance (VII-2, 11th grade standardized test scores over 50%) based on the types of scheduling practices used by high schools in Virginia.

Analysis through use of the ANOVA technique yielded no single probability less than .05 (Table 8). Hypothesis 1.02 was therefore not rejected for the dependent variable O2 (Indicator VII-2, 11th grade standardized test scores over 50% ).

Table 8

ANOVA on second dependent variable-O2

OAP--VII-2:

Source of variance	SS	df	MS	F	Level of
					Significance
Between groups	40.335	1	40.335	0.226	0.635
Within groups	37470.681	210	178.432		
Total	37511.016	211			



## Hypothesis 1.03:

There is no significant difference ( $p < .05$ ) in Outcome Accountability Project performance (VII-3, students with 10 days or less absent) based on the types of scheduling practices used by high schools in Virginia.

Analysis through use of the ANOVA technique yielded no single probability less than .05 (Table 9). Hypothesis 3 was therefore not rejected for the dependent variable O3 (Indicator VII-3, students with 10 days or less absent).

Table 9

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ANOVA on third dependent variable-O3

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OAP--VII-3:

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Source of variance	SS	df	MS	F	Level of Significance
Between groups	87.496	1	87.496	0.464	0.497
Within groups	39607.726	210	188.608		
Total	39695.222				

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## Hypothesis 1.04:

There is no significant difference ( $p < .05$ ) in Outcome Accountability Project performance (VII-4, student dropout percentage) based on the types of scheduling practices used by high schools in Virginia.

Analysis through use of the ANOVA technique yielded no single probability less than .05 (Table 10). Hypothesis 4 was therefore not rejected for the dependent variable O4 (Indicator VII-4, student dropout percentage).

Table 10

ANOVA on fourth dependent variable-O4

OAP--VII-4:

Source of variance	SS	df	MS	F	Level of Significance
Between groups	0.924	1	0.924	0.133	0.715
Within groups	1454.198	210	6.925		
Total	1455.12 2	211			

### Summary of Analyses

The data revealed that the vast majority (98%) of high school schedules in Virginia are 6 or 7 period day schedules. Only 2% of the schedules were block. School bus schedules and school board regulations were the two most commonly cited location-specific factors reported by principals as impacting on school schedules. Eighty-three percent of the principals reported schedule changes since 1983, and 75 principals reported that changes were under consideration for the future. Thirty-three (44%) of those 75 stated that they were interested in scheduling their school in a block format.

Counts and percentages (Tables 1-4) were computed on the initial spreadsheet (Excel 4.0, Microsoft, 1992). Descriptive statistics were also performed on the dependent variables (Tables 5 and 6). Analysis of variance (ANOVA) was performed on each of the dependent variables, O1, O2, O3, and O4 (Tables 7-10). No statistical relationships were found to exist.

## Chapter V

### Conclusions, Discussion, and Recommendations for Future Research

#### Summary

It was the intent of this study to investigate the relationship between scheduling practices and student productivity as evidenced by certain Outcome Accountability Project indicators. As principals begin to respond to school restructuring, the allocation of time for learning and its impact on student productivity will become a critical issue. In this study, school schedules from the Commonwealth of Virginia were categorized by schedule type and their relationship to specific outcome indicators was investigated. The design of this study was causal-comparative. Its principal advantage was that it allowed this researcher to investigate school scheduling types in the Commonwealth, those factors that impact on schedule type, and the relationship schedule type may have to increased learning opportunities for students.

The study involved 216 high school principals who completed and returned survey instruments out of a population of 265, representing an overall mail return rate of 82%. Schools represented ranged from 203 students to 2866 students. Nearly 43% of the principals surveyed had at least 5 years experience at their schools.

The hypothesis was tested by means of a single statistical procedure, one-way analysis of variance (ANOVA). The hypothesis investigated in this study, stated in null form, was:

Hypothesis 1.01:

There is no significant difference ( $p < .05$ ) in Outcome Accountability Project performance (VII-1, 11th grade standardized test scores above the 75%) based on the types of scheduling practices used by high schools in Virginia.

Analysis through use of the ANOVA technique yielded no single probability less than .05 (Table 7). Hypothesis 1.01 was therefore not rejected for the dependent variable O1 (Indicator VII-1, 11th grade standardized test scores above the 75%).

Hypothesis 1.02:

There is no significant difference ( $p < .05$ ) in Outcome Accountability Project performance (VII-2, 11th grade standardized test scores over the 50%) based on the types of scheduling practices used by high schools in Virginia.

Analysis through use of the ANOVA technique yielded no single probability less than .05 (Table 8). Hypothesis 1.02 was therefore not rejected for the dependent variable O2 (Indicator VII-2, 11th grade standardized test scores over the 50%).

Hypothesis 1.03:

There is no significant difference ( $p < .05$ ) in Outcome Accountability Project performance (VII-3, students with 10 days or less absent) based on the types of scheduling practices used by high schools in Virginia.

Analysis through use of the ANOVA technique yielded no single probability less than .05 (Table 9). Hypothesis 1.03 was therefore not rejected for the dependent variable O3 (Indicator VII-3, students with 10 days or less absent).

Hypothesis 1.04:

There is no significant difference ( $p < .05$ ) in Outcome Accountability Project performance (VII-4, student dropout percentage) based on the types of scheduling practices used by high schools in Virginia.

Analysis through use of the ANOVA technique yielded no single probability less than .05 (Table 10). Hypothesis 4 was therefore not rejected for the dependent variable O4 (Indicator VII-4, student dropout percentage).

The hypothesis (1.01) was concerned with statistically testing whether or not scheduling type influences student productivity as measured by the percent of students scoring at the seventy-fifth percentile on the Virginia State Assessment Program. Contrary to the research hypothesis, no relationship was found to exist. For purposes of this study, then, the notion must be discounted

that OAP indicator VII-1, 11th grade test scores above the 75%, can be seen as related to scheduling type.

In addition, the hypothesis (1.02) was concerned with statistically testing whether or not scheduling type influences student performance as measured by the percent of students scoring at the fiftieth percentile or above on the Virginia State Assessment Program. Contrary to the research hypothesis, no relationship was found to exist. For the purposes of this study, then, the notion must be discounted that OAP indicator VII-2, 11th grade test scores above 50%, can be seen as related to scheduling type.

Moreover, the hypothesis (1.03) was concerned with statistically testing whether scheduling type influences student productivity as measured by the percent of students who missed ten days or fewer from school. Contrary to the research hypothesis, no relationship was found to exist. For purposes of this study, then, the notion must be discounted that OAP indicator VII-3, students with 10 days or less absent, can be seen as related to scheduling type.

Lastly, the hypothesis (1.04) was concerned with statistically testing whether or not scheduling type influences student productivity as measured by the percent of student dropouts. Contrary to the research hypothesis, no relationship was found to exist. For purposes of this study, then, the notion must be discounted that OAP indicator VII-4, student dropout percentage, can be seen as related to scheduling type.

## Conclusions

The following conclusions are based on the findings of this study:

1. There is no relationship between scheduling type and the four OAP indicators.
2. Since 1983, a large majority (83%) of the respondents report changes in their school schedule.
3. A significant number (33%) of principals reported that consideration is being given to future changes in schedule type.
4. While it was not the primary intent of this study to investigate the relationship between location-specific factors and scheduling type, principals report that at least two of the factors (school bus schedules and school board regulations) were deemed to be important influences on schedule development.
5. Although the data were not solicited, principals voluntarily reported that Channel One programming influences scheduling decisions.
6. Six- and seven-period day schedules predominate (98%) in Virginia high schools.
7. Nearly 70% of scheduling design decisions made in schools are made by the principal.
8. Two-thirds of the principals have been in their present schools four years or less.



### Implications

1. Research recommends significant changes in the way schools use allocated time; however, there is little variation in the ways schools presently use time. Until greater variation in scheduling practices occurs, researchers in Virginia likely will be unable to determine whether a relationship exists between schedule type and student productivity.

2. The high rate of return and the high rate of request for study results indicate a significant degree of interest by principals in the scheduling topic. This apparent interest may indicate a change in high school scheduling practices in the future.

3. Overwhelmingly, principals reported having the authority to control the way learning time is allocated at their schools. Research clearly indicates that responsibility for the careful management of allocated learning time rests with the principal. Principals must begin to re-evaluate present time use to maximize student learning opportunities.

4. Principals cited school board regulations and school bus schedules as two location-specific factors that impact on scheduling practices in their schools. Principals and district superintendents must work within their school-communities to establish alternatives to those present school board regulations and transportation constraints that limit more flexible uses of allocated learning time.

### Recommendations for Future Research

1. When this investigation was conducted, it was assumed that greater variation in scheduling type existed. Future researchers should study whether the same results would occur if the study revealed greater variation in scheduling type. Trends indicate that within several years greater scheduling type variation will exist.

2. When this investigation was conducted, it was assumed that a greater degree of collaborative decision-making existed in regard to school schedules. If one assumes that there will be a shift toward greater staff participation, the impact of that change on scheduling practices should be investigated.

3. This investigation revealed that school bus schedules overwhelmingly (93%) impact on school scheduling practices. If student transportation issues restrict creative scheduling practices, then principals, superintendents, and school boards should investigate alternative student transportation models.

4. The four Outcome Accountability Project indicators are only several of many potential indicators that could be used to assess the impact of school schedules on student productivity. It is recommended that future researchers replicate this study using other student outcomes as measures of productivity.

5. Although not specifically included on the Scheduling Practices Questionnaire, Channel One television programming was cited by a number of principals as having an effect on scheduling practices. Future research on school time use should review the impact that Channel One television has had on school scheduling practices.

6. Future researchers should investigate the degree to which the features that characterize high school schedules have changed. The study of changes in high school schedules will become increasingly important as educators begin to respond to the restructuring initiative.

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## APPENDIX

# SCHEDULING PRACTICES QUESTIONNAIRE

87

High School \_\_\_\_\_

Principal \_\_\_\_\_

The purpose of this questionnaire is to obtain information about your school bell schedule. Please answer the five questions below as accurately as possible.

1. How long have you been principal at this school? \_\_\_\_\_ year/years

2. In your division, does the principal have discretion over bell schedule design? yes no

a. If yes, who designs the bell schedule in your school?

\_\_\_\_\_ principal \_\_\_\_\_ assistant principal \_\_\_\_\_ counselor \_\_\_\_\_ other

If other, please explain \_\_\_\_\_

\_\_\_\_\_

3. Has the school bell schedule changed since 1983? yes no

a. If yes, please state when and why the schedule was changed.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

b. If no, but a schedule change is being considered, please explain why.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

4. Please identify any location-specific factors that affect the bell schedule at your school.

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\_\_\_\_\_ School Bus Schedules

\_\_\_\_\_ Security/Safety Issues

\_\_\_\_\_ School Board Regulations

\_\_\_\_\_ Geographic Concerns

\_\_\_\_\_ Facility Limitations

\_\_\_\_\_ Work Force Demands

\_\_\_\_\_ Staffing Limitations

\_\_\_\_\_ Patrons' Expectations

Other \_\_\_\_\_

5. The bell schedule you attach to this questionnaire will be reviewed and categorized. In the space provided below, please address any specific features of your bell schedule that may need clarification (e.g. activity schedules or early morning classes).

**PLEASE REMEMBER TO ATTACH A COPY OF YOUR SCHOOL BELL SCHEDULE TO THIS QUESTIONNAIRE. BOTH DOCUMENTS ARE NEEDED FOR THE STUDY.**

**I WOULD LIKE A COPY OF THE RESULTS OF THIS STUDY. YES NO**



JONATHAN L. LEWIS  
2123 AVONDALE DRIVE  
MECHANICSVILLE, VIRGINIA 23111  
(804) 730-2849

89

January 18, 1993

Dear

I am writing to request your assistance with my research project studying the relationship between time allocation and student productivity in Virginia high schools. In order to complete the study, I need principals throughout the Commonwealth to send me copies of their school bell schedules and completed Scheduling Practices Questionnaires.

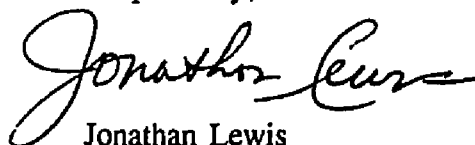
I plan to review and categorize each schedule received, then, using five Outcome Accountability Project (OAP) indicators as measures of student productivity, determine whether relationships exist between specific schedule types and OAP performance. Additionally, I plan to investigate features that characterize school bell schedules in Virginia high schools, and determine whether or not schools are experimenting with different ways to use instructional time.

The Scheduling Practices Questionnaire will take only a few minutes to complete. Please be sure to attach a copy of your school bell schedule to the questionnaire, for both documents are critical to completion of the study. Please be assured that no school will be identified in the study and that complete confidentiality of data received from schools and the Department of Education will be maintained at all times. If you would like a copy of the results of this study, please check the space provided at the bottom of the Scheduling Practices Questionnaire.

This study is being conducted under the supervision of Dr. James Stronge, Associate Professor at the College of William and Mary. Any questions or concerns related to the study may be directed by phone to me at (804) 746-5261 or Dr. Stronge at (804) 221-2339.

Thank you for your assistance. I truly appreciate your time and interest.

Respectfully,

  
Jonathan Lewis

JONATHAN L. LEWIS  
2123 AVONDALE DRIVE  
MECHANICSVILLE, VIRGINIA 23111  
(804) 730-2849

90

February 18, 1993

Dear

Several weeks ago I wrote to you requesting your assistance with my research project studying the relationship between time allocation and student productivity in Virginia high schools. I am writing once again to request your help. In order to complete the study, I need principals throughout the Commonwealth to send me copies of their school bell schedules and completed Scheduling Practices Questionnaires.

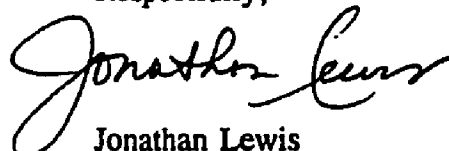
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Thank you for your assistance. I truly appreciate your time and interest.

Respectfully,



Jonathan Lewis

**Vita****Jonathan Leopold Lewis****Birthdate:** April 26, 1951**Birthplace:** Allentown, Pennsylvania

**Education:** 1983-1986 The College of William and Mary  
Williamsburg, Virginia  
Educational Specialist

1977-1979 Virginia Commonwealth University  
Richmond, Virginia  
Master of Arts

1969-1973 University of Richmond  
Richmond, Virginia  
Bachelor of Arts

**Professional Experience:**

1989- Principal, Lee-Davis High School  
Hanover County Public Schools  
Mechanicsville, Virginia

1988-1989 Principal, Armstrong High School  
Richmond Public Schools  
Richmond, Virginia

1983-1988 Assistant Principal, Armstrong High School  
Richmond Public Schools  
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1979-1983 English Teacher, Thomas Jefferson High  
School  
Richmond Public Schools  
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