A COMPARISON OF SELECTED INDICATORS OF EDUCATIONAL OUTCOMES IN SMALL AND LARGE MIDDLE SCHOOLS IN VIRGINIA

by

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Dissertation submitted to the Faculty of the
Virginia Polytechnic Institute and State University
in partial fulfillment of the requirements for the degree of

DOCTOR OF EDUCATION
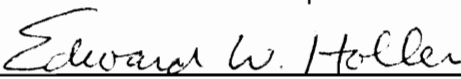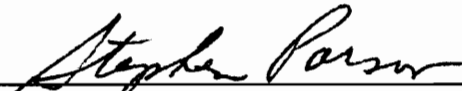
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Educational Administration

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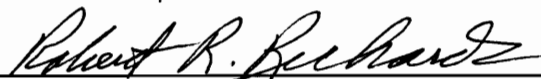Glen Earthman, Chairman

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February 27, 1997

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Key Words: School-Size, Large-School, Small-School, Achievement, Curriculum

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(ABSTRACT)

Middle school education emerged nationally during the late 1960's and early 1970's and was emphasized as a requirement for accreditation in the state of Virginia by 1986. This study examined the effect of school size on a set of indicators related to outcome variables from 6-8 configuration middle schools in the state of Virginia. Research suggests that the size of middle schools may be related to school effectiveness. Is there a difference between educational outcomes of small and large middle schools in the state which is related to size?

The study examined seven measures of outcomes to determine if there is a significance difference in the indicators of school success which can be attributed to school size. The study focused on the following seven indicators: The percent of students in grades 6-8 who were absent 10 days or less from school, the percent of 8th grade students who took a foreign

language prior to the 9th grade, the percent of minority 8th grade students who took a foreign language prior to the 9th grade, the percent of 8th grade students who took Algebra I or Algebra I, Part I prior to the 9th grade, the percent of minority 8th grade students who took Algebra I or Algebra I, Part I prior to the 9th grade, the percent of 8th grade students who took the Virginia State Assessment Program standardized tests whose composite scores were above the national 75th percentile, and the percent of 8th grade students who took the Virginia State Assessment Program standardized tests whose composite scores were above the national 50th percentile.

Separate analysis of covariance (ANCOVA) tests were used for each indicator of educational outcome. A socioeconomic status index was used as a covariate in all of the tests. Statistical Package for the Social Sciences (SPSS) software was utilized for all computations.

The study produced evidence that small middle schools and large middle schools are not significantly different over a range of indicators. In six of the seven indicators compared, small schools were found to not have an advantage over large schools. A significant difference was found between small schools and large schools in the indicator of the percentage of minority 8th grade students taking Algebra I, or Algebra I Part I prior to the 9th grade.

hours you spent alone, all the quiet hours provided, and all of the other ways the two of you gave me space and time, I am grateful. I hope that you share this with me forever.

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CHAPTER ONE

INTRODUCTION

In 1987, a 17 member panel of the Carnegie Council on Adolescent Development was given the task of reviewing the needs and changes in the way 10 to 15 year-olds were educated. Panel members included then Gov. Bill Clinton of Arkansas, Senator Nancy L. Kassebaum (R.-Kan.), former Maryland Superintendent of Schools David Hornbeck, and Yale University child psychiatrist, James Comer. Their report, "Turning Points, Preparing American Youth for the 21st Century," suggested wide-ranging changes in the way middle school grades are managed, taught, and supported. One of their strongest recommendations called for the breaking up of large, impersonal schools into smaller communities, where stable, close, and mutually respectful relationships could be forged.(Turning Points,1989).

Nine years later, the debate over large vs. small middle schools continues to be an issue. In the report "America's Middle Schools: Practices and Progress, a 25 Year Perspective," the report found that middle level schools have become larger, not smaller. The proportion of such schools enrolling more than 800 students, for example, more than doubled from 13 percent 25 years ago to 30 percent in 1995. A 1992 national survey of

middle level principals considered the optimum middle school to be between 400 and 599 students. A school size between 600 and 799 was the second most desired. Schools with enrollments over 800 were considered too large for effective instruction (Valentine,et al., 1993). In contrast, McEwin (1995) states the ideal size for middle schools is 400 to 800 students.

Meier (1995) examined six reasons why small schools are essential for learning. First, small schools allow teachers the opportunity for change and experimentation without fear of failure. Second, small schools allow teachers to have access to each others' work. Teachers know the strengths and weaknesses of their colleagues. Third, small schools allow teachers to know a student's work. A teacher can get to see the student not only as a classroom participant, but also as a person with certain moods that can be witnessed in the cafeteria and hallway as well. Fourth, small schools offer the element of physical safety. Knowing which students are likely to be disruptive in certain circumstances can be a proactive measure. Reason number five centers on accountability, not only from within the school, but also for the community. Finally, small schools allow for the shaping of culture and the preparation of young people for the future.

Holler (1995) focused on a debate in the literature on the issue of school size in relation to the effectiveness and efficiency of schools. Both small and large school environments are identified as being favorable for meeting the needs of students. Large schools can provide a broader and deeper program. In small schools, an increased awareness of the importance of social conditions at school, the supportive nature of small school environments, and the potential benefits from closer community relations are seen as advantages. The advantages and disadvantages of both small and large are outlined in the literature.

Howley (1989) reported that students in small schools have more positive attitudes toward school. Regardless of whether they attend schools in rural or urban settings, students attending small schools have a deeper attachment to their schools and are more likely to participate in extracurricular programs such as drama and sports. Similarly, Streifel, Holman, and Foldesy (1992) found that larger schools offer a more expansive curriculum and a greater number of student activities. However, there are also more students competing for the available slots. Barker (1985) summarized that the advantages of small schools included having students at the center of the school, fewer problems with discipline, relationships between students, teachers, administrators, and school board

members tended to be closer, and parental and community involvement tended to be stronger than in larger schools.

Statement of the Problem

This study explores the possible relationship between school size and indicators of school effectiveness in middle schools in Virginia. More specifically, it focuses on differences between educational outcomes of small and large middle schools in the state. It examines a sample of large and small middle schools to determine if there is a significant difference in various measures of school effectiveness related to school size.

The study is guided by the following questions:

A. Is there a difference in the percent of students in grades 6-8 who were absent 10 days or less from school?

B. Is there a difference in the percent of 8th grade students who took a foreign language prior to the 9th grade?

C. Is there a difference in the percent of minority 8th grade students who took a foreign language prior to the 9th grade?

D. Is there a difference in the percent of 8th grade students who took Algebra I or Algebra I, part I prior to the 9th grade?

E. Is there a difference in the percent of minority 8th grade students who took Algebra I or Algebra I, Part I prior to the 9th grade?

F. Is there a difference in the percent of 8th grade students who took the Virginia State Assessment Program standardized tests under standard conditions whose composite scores were above the national 75th percentile.

G. Is there a difference in the percent of 8th grade students who took the Virginia State Assessment Program standardized tests under standard conditions whose composite scores were above the national 50th percentile.

Purpose

The purpose of this study is to examine the relationship between selected educational outcomes and middle school size in Virginia to determine the extent to which size is a factor in differences in the selected factors. Research suggests that the size of middle schools may be related to school effectiveness. Evidence will be produced to determine if small middle schools and large middle schools are significantly different over a range of indicators (Virginia Outcome Accountability Project) of school success.

The Significance of the Study

Once data have been gathered and analyzed in this research, a greater understanding of the associations between school size and selected educational outcome indicators may be developed. This association will be examined very carefully.

By assessing and reporting the association of school size and educational outcome indicators in Virginia's middle schools, the results may be helpful for future reference. In an attempt to end educational disparity, Holler (1995) stated that research is needed to build an empirical base which focuses on the quality of education offered by middle schools of different sizes. Policy makers need to know if a difference exists between large and small middle schools in educational outcomes and curriculum characteristics. The ability to meet state mandates for instruction may be linked to the size of a school. The effect of size, a factor over which many local educational agencies have little control, may be important in evaluating a school's ability to meet the needs of students.

Holler (1995) stated that the issue of school restructuring may be affected by information relating school size to educational outcomes. Local school boards and state planners need information about the effect of school size in order to make informed decisions about consolidation and

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construction of new facilities and school reorganization. Policy makers must be able to make informed decisions about what actions will be most effective in improving educational programs. Information linking school size to educational inputs and outcomes would be vital to the decision-making process involved in any plan which attempts to improve educational opportunity.

Holler (1995) reported that funding decisions may be affected by information relating school size to educational outcomes. Policy makers could apply funds toward inequities which are the result of school size. Information associating school size to educational outcomes would be useful to people attempting to provide equal educational opportunity to all children in the state.

Definitions

1. Large Middle Schools- Schools having a population of more than 1000 students.

2. Small Middle Schools- Schools having an enrollment of 1 to 400 students. (McEwin,et al., 1996).

3. Virginia Outcome Accountability Project- A comprehensive program to report performance data on Virginia's schools and school divisions.

4. Middle Level Education- The term used to indicate the category of school units and organizations separate from elementary and high schools that attempt to deal with the unique needs of 10 to 14 year old youngsters. The programs in middle level schools offer various combinations of grades 5 through 9. Only middle schools which contain at least three grades and cover the grades 6-8 will be included in this study.

5. Middle School- A middle level school organization that usually includes grades 6,7, and 8. The middle school was built on a rationale that most 6th and 8th graders demonstrate learning and human characteristics similar to those formerly found among 7th, 8th, and 9th grade youngsters (NASSP,1985).

Limitations:

1. Student achievement is defined by using the outcomes on the Virginia Outcome Accountability Program Data.

2. The study will be limited to middle schools in Virginia, and the results can only be generalized to schools in Virginia although cautious generalizations may be made to large and small schools in other parts of the country.

3.   The rural or urban setting of a school has an influence on size. This study will not address the rural or urban issue.

4.   The element of measuring size in a school was determined by the number of 8th graders taking the Virginia State Assessment Program standardized tests in 1995.

5.   Student population socioeconomic differences cannot be accounted for in the study. Many educational inputs and outcomes are related to the wealth of the community in which a school is located. However, the number of reduced/free lunch students will be used as a measure for socioeconomic differences and is used as a covariate in this study.

Summary of the Study

Chapter One of this proposal identifies the problem to be studied. The basis for the study is established by offering a general introduction to the relationship between school size and educational outcomes. The significance and limitations of the study are also reviewed.

The nature and scope of the research problem are presented through a review of relevant literature relating school size to selected indicators of educational outcomes in Chapter Two.

The population and sample studied are described in Chapter Three. Nine separate pieces of data have been compiled for each middle school included in the study. Data sources are identified and explained. Most of the data was available through the State Department of Education.

This comparative study examined two sets of middle schools at opposite ends of the size spectrum within Virginia. By examining the difference in data collected on several outcome indicators, the effect of size on the selected indicators was determined.

The results obtained in the study are reported in Chapter Four by reviewing the statistical relationship found between size and each of the sub-questions.

Chapter Five contains implications of the results. Conclusions drawn by the researcher from the study are reported. Suggestions for related research is included.

References and Appendices are included in the appendix.

Chapter 2

A Review of the Related Research

Introduction

The purpose of this chapter is to discuss the research which identifies or negates school size as a factor affecting the effectiveness and efficiency of a middle school. Research is presented which will relate school size to environmental factors and to efficiency considerations. The literature review is organized into two major sections. Section one describes economy of scale and its application to educational settings. Section two will describe what is known about the influence of school size on several indicators of school success including curriculum and achievement.

Klonsky and Ford (1994) stated that small schools with fewer than 350 students make pursuing a systemic approach to school improvement more manageable. Small schools are also less likely to produce adversarial school politics and more likely to encourage strong democracy.

Holler (1995) stated that small schools are related to effectiveness, community and school identity, and individual fulfillment and participation. Big schools correspond with efficiency, bureaucracy and personal isolation. An advantage or disadvantage in educational opportunity presented to

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students, as indicated by measures of educational inputs and outcomes, may be linked to the size of schools. One may speculate that there is a point related to the size of the school, when student opportunity becomes limited or unavailable. The limit may vary among different indicators of school success.

Economy of Scale

School Efficiency

Effective middle level schools work hard to reduce the size of the group to which students belong. Young adolescents need more structure and security than the traditional junior high can provide. Where middle schools reorganize into smaller, more personal groups of teachers and students, discipline problems decline, attitudes towards school improve, and teacher morale and student achievement go up (George and Oldaker, 1986). Beckner and O'Neal (1980) reported that to carry out the middle level program, there should be at least three grades in the middle school. Two grade schools, which means that children must move quickly from one school to another, do not provide enough stability.

Holler (1995) cited the Conant study (1959) as influencing educational leaders to use consolidation of small schools as a means of improving the educational opportunity of students. This led to a

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consolidation movement where thousands of small schools were absorbed into larger schools or merged together to form a new, bigger school.

The search for the most effective kind of school for 10-14 year old students began at the turn of the century when most students only completed elementary school, followed by the emergence of the junior high school (grades 7-9). The junior high school experienced rapid growth in the 1920's and 30s. By 1960 a majority of students went through a pattern of six years of elementary school, three years of junior high and three years of high school. Dissatisfied with the typical junior high program, educational leaders such as William Alexander and Donald Eichhorn began to push for a program to accommodate the needs of 10-14 year olds. The middle school movement began to grow in the 1960's, and it is now the predominant form of school organization through which students aged 10-14 enter high school (Cawelti,1988). McEwin (1993) reported that 59 percent of the country's middle schools were established after 1980, while 75 percent of 7-9 junior high schools were established prior to 1980. From 1970 to 1987, grades 6-8 increased 160 percent, 5-8 schools increased 47 percent and 7-8 schools increased 7 percent (Alexander and McEwin, 1989). Junior highs decreased by 53 percent, from 4,711 schools to 2,191. In 1993, the

number of junior high schools had dropped to 1,425 (McEwin, Dickinson, and Jenkins,1995).

School districts change the grade spans of their schools for several reasons. Sometimes, grade spans are changed to reflect a new educational philosophy. Decisions to change the grade spans are usually accompanied by plans to improve educational practices. In other instances, grade spans have less to do with educational decisions than with population density and available buildings. Because grade span is often the result of mechanical and demographic factors, grade span is unlikely to be the main determinant of effective schools for early adolescents (Epstein and MacIver, 1990).

The push for consolidation of smaller schools continues today. For the better part of this century, consolidation was viewed as the cure all for all rural and small school problems. Higher quality programs and less expensive schools were admirable goals of educators supporting consolidation. Between 1930 and 1972, the number of elementary and secondary schools in the United States dropped from 262,000 to 90,876. The number of school districts declined at an even faster rate, from 128,000 to 16,960 (Sher&Tompkins, 1976).

Hind (1979) stated that the trend toward larger school units continues in the absence of persuasive evidence that the movement has

achieved the objectives held by either its past or present advocates. During the preconsolidation era from the late 1880's to 1970, the majority of the research indicated that combining schools improved the quality of education and reduced costs. However, since 1970, studies have shown that consolidation had either no impact or a negative impact on the quality of education.

Consolidation can have a negative effect. A major disadvantage of consolidation is in the morale of students and school personnel (Beckner and O'Neal, 1980). Barker and Gump (1964) found that a larger percentage of the student body participated in extracurricular activities in smaller schools. Other disadvantages of large schools included decreased participation in decision making by teachers and administrators; a proliferation of bureaucracy; increased tension between administrators, teachers, and students; a greater proportion of resources required for discipline problems; less parent involvement; and decreased human contact resulting in frustration for students and staff (Nelson, 1985; Sher and Tompkins, 1977). The nature of these disadvantages are some of the cornerstones for an effective middle school.

Holler (1995) stated that larger schools can offer students a higher quality education due to the breadth and depth of the program and at a

lower cost. This is the concept of economy of scale. Tholkes (1990) outlined the relevance of economy of scale in education. He stated economy of scale is the relationship between average cost and the number of units of production. Use of economy of scale, which stems from economics and management science, in education requires that function, input, and capacity be defined. Function is the service provided by schools. Inputs are factors of production necessary to generate educational services (personnel, purchased services, supplies, facilities, and equipment). Outputs are products (graduates, courses, co-curricular activities, and support services). Capacity is the maximum number of students which can be served a specified educational program at given class sizes and teacher ratios. Each additional function becomes a smaller percent of the whole. Economy of scale is realized as long as one service experiences lower average costs by enrolling one more student,i.e., the per unit cost decreases with the addition of one or more units of production.

Holler (1995) cited several educational leaders and their research on understanding economy of scale and its application in educational settings. Fox (1981) cautioned the use of size economy when planning reorganization of schools. Perceived benefits from consolidation may not be realized due to costs and conditions which are generated by reorganization. Hind (1979)

found that school closures were not as economically beneficial as had been projected due to transportation and other costs. Melnick (1986) found no significant difference between small schools and large schools in the cost of educating students. Swanson (1988) argues that benefits of economy of scale disappear quickly after reorganization and do not appear to be a long range solution for budgetary problems. Tholkes and Sederberg (1990) stated economy of scale arguments are often used and misused to support rural school consolidation. In all of these studies, circumstances were discovered which mitigated the desired effects of economy of scale. To support the components of a successful middle school program, bigger may not always be better.

Other factors may influence middle school consolidation. Sher and Tompkins (1977) stated that benefits from economy of scale are to be expected only in compact geographic areas or where buildings are dilapidated; otherwise, transportation, distribution, salary, and construction costs cancel the savings which are generated from consolidation. This further limits the desired effects of economy of scale. Monk (1987) contended that greater resource specialization and curricular comprehensiveness should occur in larger secondary schools, but the benefits of size become insignificant after a relatively small enrollment has

been reached. Monk (1987) contended that a moderately sized school can provide the same program as a large school and retain the benefits of a small school environment.

Effective middle schools must retain certain elements and programs unique to the 10-14 year-old adolescent. There is not enough solidly supportive evidence of size being an indicator of efficiency. Although research on optimum school size has provided mixed results, most teachers and parents clearly feel that class size radically affects the quality of instruction and achievement of students. Glass (1982) suggested that smaller classes are more conducive to improved pupil performance than larger classes, pupils in small classes have more interest in learning and smaller classes provide more opportunities to adapt learning programs to individual needs.

Advantages and Disadvantages Due to Size

Holler (1995) reported that both large and small schools can claim to have advantages in the program they provide to students. Generally, studies have indicated that small middle schools have a more healthy environment and large schools have a more comprehensive program. The studies which have compared middle schools of different sizes have almost universally

supported the need for a broad and deep program and a friendly, personal environment.

Beckner (1993) listed six advantages of smaller schools over large schools. First, Beckner examined community relationships and control. In a small school, the community exerts more direct control of the school and thus sees that the school serves the specific needs of the community. Second, because citizens feel a more direct relationships to the schools, they tend to be more willing to support them financially. Third, administrators' relationships with students, parents, and other community members are usually more cooperative. There is less bureaucracy and red tape. Fourth, teachers are more likely to be respected as valuable members of the community.They know the parents better and, therefore, receive better cooperation in resolving problems that arise. Fifth, students have more pride in their community, their school, and in themselves, which results in improved student conduct. Also, school morale tends to be higher in smaller schools. Lastly, smaller schools are likely to be learner-centered. It is easier to make changes in curriculum organization and instructional materials and to achieve curriculum articulation and coordination.

Barker (1985) pointed to evidence in the literature to suggest that small schools are able to create environments more conducive to teaching

and learning that large schools. He says the challenge of the small schools is to maintain the benefits of a small school but to improve the quality of the program offered.

The discussions that were examined in Turning Points (1973) reflects that schools should be a place where close relationships with adults and peers create a climate for personal growth and intellectual development. Many large middle grade schools function as mills that contain and process endless streams of students. For large middle schools to be successful, three things must happen. First, the enormous middle grade school must be restructured in a more human scale. Students and adults should get to know each other well to create a climate for intellectual development. Students should feel that they are a part of a community of shared educational purpose. Second, the discontinuity in expectations and practices among teachers, the lack of integration of subject matter, and the instability of peer groups must be reduced. Every student must be able to rely on a small, caring group of adults who work closely with each other to provide coordinated, meaningful, and challenging educational experiences. In turn, teachers must have the opportunity to get to know every one of their students well enough to understand and teach them as individuals. Finally, every student needs at least one thoughtful adult who has the time

to talk with the student about academic matters, personal problems, and the importance of performing well in middle grade school. The progress of small-school invention and middle school restructuring points to a practical way that reform may yet be successful within the larger system of public education. Barker (1985) pointed to technology and alternative delivery systems as methods which can bridge the gap small schools face. Some schools are using supervised correspondence courses and traveling teachers to improve programs. Also, increased awareness of the importance of social conditions at school, small school environments' effect on individuals, and state equity issues are seen as being more favorable in small schools. The whole body of research related to effective schools places small schools in a much more favorable position than large schools in reaching specific educational goals. With the strong suspicion that both curricular superiority and economic efficiency are not as beneficial to students as theory intended, it seems that bigger is not better and may even provide an inferior situation for the students attending large middle schools across the state.

A distinct advantage of larger schools is that a more comprehensive curriculum can be offered. Fonstad(1973) reviewed 137 studies related to school size and discovered that 90 percent of this research showed that curricular offerings were greater in larger schools. Larger schools are also

considered more attractive by teachers looking for jobs. Other advantages of larger schools include improved extracurricular programs, more prominent identity in the community (Nelson,1985), improved facilities and a higher level of pupil achievement (Edington, 1976)

Holler (1995) stated that weaknesses found in most of the opinions about optimal size are issue related. When examining curricular comprehensiveness, it is easy to select an optimal size mathematically. If environmental issues such as student isolation, participation in extracurricular and intramural, community involvement, or teacher participation in activities is the criteria for optimal size, the resulting figure is much different. Opponents of large schools contend that close contact with teachers is lost when schools become too big. Also, student leadership and participation opportunity, parent and community involvement, and school awareness is greater in small schools. Because of this, members of the public have expressed outrage at school consolidation. Emotion is also a factor in the closing of schools in many communities. During the late 70's, integration played a large part in the consolidation of buildings. This was especially true in areas where the African-American high school building was consolidated into the middle school. Local residents were less willing to accept consolidation and integration of schools because many people

identify the community with the local high school, especially through the athletic programs.

Areas of Comparison in School Size Issues

The literature indicates that the influence of school size may be reflected in several areas. Alexander and George (1981) identified several areas where advantages can be claimed by either large or small middle schools. The areas include the following:

1.   Transition/Articulation

2.   Block Time Schedule/Interdisciplinary Teams

3.   Exploratory

4.   Appropriate Core Curriculum/Learning Skills

Transition/Articulation

School size can be a major factor contributing to students' sense of anonymity and alienation. Typically, students leave smaller feeder elementary schools for much larger and more impersonal middle schools. Overwhelming school size often combines with large class size and a brief homeroom period devoted to administrative matters often leave incoming elementary students without a strong sense of place or belonging. The aspect of articulation-bridging the educational transition from childhood to adolescence for its clients, is important for all schools, regardless of size.

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McEwin et.al., (1996) reported that middle schools have, since their inception, employed multiple means of articulating with elementary and high schools. This is particularly true relative to the actual physical transition between very different school organizations, curriculums, and programs. For many young adolescents the transition from the elementary school to the middle schools means a major change in the number of peers and adults they interact with daily; the larger the school, the more contacts with other students will be established. The use of multiple simultaneous paths of articulation on the part of middle schools is an effort to insure that multiple target audiences such as teachers, parents, and students, as well as curriculum and programs, will be impacted.

McEwin (1996) also examined different articulation practices. The most prominent articulation practice that 6-8 middle schools employed was visitations by elementary students from feeder schools. The second most prominent articulation practice was obtaining or providing student data on entering or exiting students. Providing information to feeder and receiving schools was the third most employed articulation activity. Student orientation visits to the high school were used extensively, as well as hosted visits by high school personnel.

Many middle schools administrators hope that middle school teachers will increase the effectiveness of articulation with their sister schools through formal visitations to learn more about the sending and receiving schools. In small school divisions, it is relative for different schools to know the feeder schools programs and practices and use these activities to form stronger linkage for their common students. This increase in visitations would further enhance articulation and the effect that all school organizations have on students.

Block Time Schedule/Interdisciplinary Teams

The most frequent model for providing flexibility in the middle school level is establishing blocks of time for teaching teams. This concept is closely linked to the establishment of interdisciplinary teams: two or more teachers who share students. A team may or may not have a similar schedule; however, scheduling all teachers on a team with the same schedule provides opportunities to increase the flexibility of the instructional program. Interdisciplinary teaming should not be confused with team teaching. Clark and Clark (1987) defined team teaching as two or more teachers working together in classroom settings to facilitate student learning. The major difference between team teaching and interdisciplinary

teaming is the emphasis that is placed on team teaching as a strategy to increase the variety and flexibility of instruction.

Tadlock and LoGuidice (1994) examined several roadblocks to the implementation of interdisciplinary teaming and block scheduling in small middle schools. Economic factors force many small schools to share facilities across grade levels. Such sharing can discourage program development and innovation, especially when a program is dependent on easy access to and ready availability of specialized facilities. Sharing the technology area or the science lab with the elementary or high school makes flexible scheduling in the middle level grades extremely difficult. Flexible scheduling requires the availability of physical facilities which accommodate a variety of activities scheduled when appropriate. Teachers often teach both middle level and high school courses, preventing team scheduling that could provide common planning time for teachers. This limits the implementation of interdisciplinary teaming.

In developing a schedule relative to the size of a building, Rettig (1996) stressed that schools should examine the following: One, a schedule can be viewed as a resource; it is the schedule that permits the effective utilization of people, space, time and resources in an organization. Two, a schedule can help solve problems related to the delivery of instruction or a

schedule can be a major source of problems, and three, a schedule can facilitate the institutionalization of desired programs and instructional practices. In many instances, schedules can be a way to reduce for students the apparent size, randomness and anonymity of a large school to the smaller, more secure and comfortable size of a sub-unit of the school. Consideration should be given to physical separation of grade level within the building and staggering the times of class change by grades of teams.

Exploratory

All students, based on their own interests and abilities in the middle school grades, should chose areas of academics, fine arts, or vocational studies for exploration. Exploratory courses, or encore, should be available to students at each grade level. This area has an advantage in large schools because the larger the student population, the greater the variety of courses can be offered to students. In a study examined by McEwin (1996), the most frequently offered electives at the 6th grade level for schools were band, chorus, orchestra, art, general music, and computers. In the 7th grade, the courses were band, chorus, art, orchestra, foreign language, industrial arts, home economics, and computers. In the 8th grade, the courses most offered by schools were band, chorus, art, foreign language, industrial arts, home economics, computers, and orchestra.

Becker (1990) stated that schools with large enrollments are able to provide computer and keyboarding classes and minicourse experiences that smaller schools are unable to provide. Exploratory minicourses and typing or keyboarding courses exist for seventh or eighth-graders in about half of all schools with more than 600 students, but in only a quarter of the schools with fewer than 250 students. High student/teacher ratios that are suggestive of larger class sizes limit the ability of schools to provide all or most of their students with such exploratory electives as industrial arts, home economics, art, and foreign language.

All students should have the opportunity to make some choices each year in the interest areas they will explore. Exploration in breath is preferable to specialization in depth for students in the middle school grades. In addition, McEwin (1996) stated that exploration calls for opportunities to participate in activities that interest students either academically or recreationally. Neither of these enrichment experiences should be considered unimportant. Exploratory education is a sound preparation for success in high school, in that high school experiences have been explored by middle schoolers before they are forced upon them.

Appropriate Core Curriculum/Learning Skills

The middle school years are, for most students, the first exposure to specialized instruction from teachers who have been trained in a discipline. An objective from the Virginia Department of Education calls for all students in the middle school grades to pursue an expanded common core curriculum which emphasizes academic and practical achievement and appropriate social, physical, and emotional growth. (Framework for Education in the Middle school Grades in Virginia, 1990).

Alexander (1995) related that a characteristic that should be sought in all size middle schools is a flexible curriculum, aiding pupils to progress at different rates and to different depths. Although the requirements of continued general education make mandatory some beginning points and goals in the basic curriculum fields, minimum grade standards can defeat the aims of intellectual development. Monk and Haller (1993), in examining school size, reported that the differential availability of teachers with relevant skills across subject areas can have significant effects across the curriculum with respect to the rate at which larger school size translates into new course offerings.

Beginning in the 1990's a renewed interest in curriculum integration for middle schools provided school districts a base for curriculum

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arrangements that involve application of knowledge rather than merely memorization and accumulation. Beane (1996) defined curriculum integration around four dimensions: First, the curriculum is organized around problems and issues that are of personal and social significance in the real world, usually identified through collaborative planning by teachers and students. Second, learning experiences related to the organizing center are planned so as to integrate pertinent knowledge without regard to subject areas. Third, knowledge is developed and used to address the organizing center currently under study rather than to prepare for some later test or grade level. Finally, emphasis is placed on substantive projects and other activities that involve real application of knowledge, thus increasing the possibility for middle level students to integrate curriculum experiences into their learning and to experience the process of problem solving.

The number of students enrolled in a school or assigned to a teacher for a single class period may affect the kinds of courses that the school provides or the kinds of activities and assignments that teachers make. Becker (1990) examined three aspects of size and a relationship to curriculum: the total school enrollment, the number of students per grade level, and the overall student/teacher ratios. Although the number of students per grade level did not affect the curriculum or student's

classroom experiences, the other two measures of institutional size were related to curriculum experiences. Principals reported more drill and practice activities among their teachers in schools with smaller class sizes. Also, smaller class sizes seemed to facilitate active modes of learning and activities focusing on higher-order competencies.

Tadlock and LoGuidice (1990) stated that in many cases, middle level education becomes a non-entity in small schools. Middle school classes are taught by elementary or secondary certified teachers who have little expertise in the developmental characteristics of young adolescents or little background in instructional practices appropriate for young adolescents. Middle level curriculums often face less challenging versions of the same courses offered to high school students. Programs which adequately address the unique physical, intellectual, social, and emotional developmental characteristics of the middle level student rarely exist. Professional development opportunities to improve curriculum instruction for staff simply do not exist or are extremely limited.

Chapter 3

Methodology

This chapter describes the procedures and methodology used in the study. The population and sample will be defined. The study will compare two groups of middle schools in Virginia. The schools included in the study will be randomly selected from stratified sections of the size continuum of middle schools because of their position in the size continuum among all middle schools in the state. This will be a quantitative study which attempts to explore the effect of an independent variable, size, on selected dependent variables, input and outcome indicators. The subjects in the study are middle schools in Virginia.The schools will be defined into a large school or small school category based on the total school population.

Instrument Used

The Virginia Outcome Accountability Project (OAP) is a comprehensive program to report data on Virginia's schools and school divisions. This report provides information on 133 school divisions and more than 1,600 local schools. The report consists of seven objectives:

1. Preparing Students for College

2. Preparing Students for Work

3. Increasing the Graduation Rate

4. Increasing Special Education Students' Living Skills and Opportunities

5. Educating Elementary School Students

6. Educating Middle School Students

7. Educating Secondary Students.

In addition, a page containing Community and Student Information is provided.

The Virginia state assessment Program (VSAP) is administered by the Virginia Department of Education in compliance with the Standards of Quality (SOQ) which require the Board of Education to prescribe and provide nationally-normed tests to assess the educational progress of students. The test results from this program provide the means by which to (1) measure the academic progress of students and (2) compare the academic achievement of individuals and groups of Virginia students to that of students in the same grades across the nation. In addition, localities may use the scores for program evaluation and planning purposes.

In 1994-95, the VSAP consisted of Form G of the Iowa Tests of Basic Skills (ITBS) and was administrated to students in grade eight. These tests are published by The Riverside Publishing Company and were used in Virginia for the ninth consecutive year. The test was normed during the 1984-85 school year. Norming involves giving tests to large groups of

students who are selected to represent the nation's student population. The scores of students who take the test after it has been normed then can be compared to the scores of the students in the norming group. Such a comparison provides a means of determining how local student achievement measures up to achievement of students across the county. Achievement tests like the ITBS sample the knowledge of students in broad content areas in order to estimate overall student and group achievement.

In the spring of 1995, 74,681 Virginia eighth-grade students took the Level 14, Form G, of the ITBS. The ITBS battery includes seven content-area tests: Vocabulary, Reading Comprehension, Language (with four subtests-Spelling, Capitalization, Punctuation and Usage and Expression), Work Study (with two subtests-Visual materials and Reference Materials), Mathematics (with three subtests-Concepts, Problem Solving, and Computation), Social studies, and Science. National percentiles for the seven content-area tests and the Complete Composite national percentile, which is the average of the first five content-area tests, are reported.

All 210 middle schools with a configuration of grades 6-8 in the state of Virginia were included in the population. The middle schools were ranked according to the size of the total school population during the 1994-1995 school year. Virginia's middle schools with a 6-8 configuration ranged in

size from 161 students to 2049 students. The average size was just under 800, with a median of 796.

In order to increase the probability of size being a factor, two divergent subsets from the population of 6-8 middle schools in Virginia were identified. A subset of the largest schools, those with more than 1000 students in the 1994-1995 school year, and a subset of the smallest schools, those with fewer than 400 students, were statistically compared in the study. Twenty schools from the two subsets in the population of 6-8 middle schools in the state were included in the study as subject schools. The twenty were comprised of ten small 6-8 configuration middle schools and ten large 6-8 configuration middle schools. The selected schools were randomly obtained from the two subsets of the population of Virginia's 6-8 configuration middle schools.

To select the schools for inclusion in the study, all middle schools with a 6-8 configuration in the state were ranked according to size, For this study, total school enrollment numbers for the 1994-95 school year are used as a measure of school size. This technique is used by several others, including McGuffey (1991), to identify school size. Using this measure will standardize size among the schools. Size can be misleading if raw student

numbers are used due to the different grade configurations which exist in schools throughout the state (Holler,1995).

Small 6-8 middle schools include those schools with a total school population of less than 400 students during the 1994-95 school year (Appendix A). Large 6-8 middle schools include those schools with a total school population of more than 1000 students during the 1994-95 school year. The small school group includes approximately nineteen 6-8 middle schools. The large school group includes approximately fifty-six 6-8 middle schools. Using these definitions for small and large middle schools limits the number of schools included in the study population. This enhances the quality of the return by selectively including only those schools which have the greatest potential of reflecting desired attributes of small and large schools (Holler, 1995).

The five smallest and the five largest 6-8 middle schools in the state were restricted from entering the sample included in the study. This is done to reduce the outlier effect. Outliers often have special characteristics which add an unwanted bias to the study. In order to remove the chance of confounding the study due to an uncharacteristic element, the very smallest and very largest 6-8 middle schools are excluded from the study population (Holler,1995).

The 6-8 middle schools were ranked according to the total school population during the 1994-95 school year from smallest to the largest. The two sets of schools eligible for inclusion were identified by removing all 6-8 middle schools with a total school population between 401 and 999 students during the 1994-95 school year. This produced two sets of 6-8 middle schools: a set of small schools and a set of large schools. Outliers were removed as described above. The remaining schools in each set were assigned a number in sequence beginning with the smallest school in each for the two groups. A random number table was used to identify the ten schools from each set to be included in the study.

Based on the described methodology, the ten small middle schools randomly selected for the study are:

1.   William Campbell Middle School, Campbell County

2.   Galax Middle School, Galax

3.   Independence Middle School, Grason County

4.   Sussex Central Middle School, Sussex

5.   George Mason Middle School, Falls Church

6.   Glade Spring Middle School, Washington County

7.   Breckinridge Middle School , Roanoke City

8.   Berkeley Middle School, Williamsburg/James City County

9.   Northumberland Middle School, Northumberland

10.   Goochland Middle School, Goochland

The ten large schools randomly selected for the study are:

1.   George Washington Middle School, Alexandria

2.   Moody Middle School, Henrico

3.   Tuckahoe Middle School, Henrico

4.   Swift Creek Middle School, Chesterfield

5.   Short Pump Middle School, Henrico

6.   Indian River Middle School, Chesapeake

7.   Benjamin Syms Middle School, Hampton

8.   Brookland Middle School, Henrico

9.   Independence Middle School, Virginia Beach

10.   Lynnhaven Middle School, Virginia Beach

Data Needs

Seven individual pieces of information were collected for each school included in the study. The information needed is grouped into three categories. The data were obtained from two sources: the Virginia State Department of Education and from a survey selected in the sample. The three categories of data are as follow:

School Size

The size component is used to identify the population of large and small schools for sampling.

Socioeconomic Characteristic

This component was used as a measure of the socioeconomic status of the community. It was hoped that some of the variance not associated with size can be accounted for by including a socioeconomic variable. Student participation in the Free and Reduced School Lunch Program was the proxy variable used to measure socioeconomic status of the community in this study.

Indicators of Educational Outputs

The indicators used to compare large and small middle schools were keyed to areas where differences have been identified. Two areas, costs and extra-curricular participation, identified by Melnick (1986), were not included in this study.

Cost was not included because of the difficulty of comparison and because a different measure of costs was being used as a covariate in the

analysis of the data. The percentage of students enrolled in the Free and Reduced School Lunch Program, a socioeconomic indicator, was used as the covariate to control for the variability due to socioeconomic differences. The use of a covariate was intended to account for the variance caused by economic differences in the communities of the schools which were included in the study. Costs are also an indicator of economic differences in the communities of the schools (Holler, 1995).

Student participation in extra-curricular activities was not included in the study because of the lack of data, and because there is a strong emphasis on students in the middle schools participating in intramurals. On the high school level, extra-curricular participation was studied in relation to dropout rates and educational opportunity. It is known that students who are involved in school activities stay in school longer. Fox (1981) found that larger schools have a greater range in the opportunity to participate in both academic and non-academic extra-curricular activities. But, because of the number of students in large schools, there are fewer opportunities to participate in those activities. As discovered by Kleinert (1969), in small schools there are more opportunities to participate and hold responsible positions in school than in large schools.

The following are the data needed for each school:

For the size component:

1.   The total number of students in grades 6-8 in the building for the 1994-95 school year.

For the Socioeconomic component:

1.   The number of students in the free or reduced lunch program in 1994-95.

The indicators of educational outcomes:

1.   Attendance indicator

      A.   The percent of students who missed ten or fewer days of school in the 1994-95 school year.

2.   Curriculum indicators

      A.   The percent of 8th grade students who took a foreign language prior to the 9th grade.

      B.   The percent of minority 8th grade students who took a foreign language prior to the 9th grade.

      C.   The percent of 8th grade students who took Algebra I or Algebra I, Part I prior to the 9th grade.

      D.   The percent of minority 8th grade students who took Algebra I or Algebra I, part I prior the 9th grade.

3.   Student achievement indicators

A. The percentage of students who are at or above the 75th percentile on the composite score of the 8th grade Virginia State Assessment Program standardized test in school year 1994-95.

B. The percentage of students who are at or above the 50th percentile on the composite score of the 8th grade Virginia State Assessment Program standardized test in school year 1994-95.

Data Gathering

The following indicators were obtained from the Virginia State Department of Education:

1. The percent of students in grades 6-8 who were absent 10 days or less from school.

2. The percent of 8th grade students who took a foreign language prior to the 9th grade.

3. The percent of minority 8th grade students who took a foreign language prior to the 9th grade.

4. The percent of 8th grade students who took Algebra I or Algebra I, Part I prior to the 9th grade.

5. The percent of minority 8th grade students who took Algebra I or Algebra I, Part I prior to the 9th grade.

6. The percentage of students who are at or above the 75th percentile on the composite score of the 8th grade Virginia State Assessment Program standardized test in school year 1994-95.

7. The percentage of students who are at or above the 50th percentile on the composite score of the 8th grade Virginia State Assessment Program standardized test in school year 1994-95.

Design and Data Analysis

In order to answer each of the research questions, the impact of size on each educational outcome was tested by using the statistical technique analysis of covariance (ANCOVA). Size was the independent variable. The indicators of educational outcomes was the dependent variables. The SES measure of the school was the covariate. The data were computed into averages or percentiles to standardize the differences in raw numbers during analysis.

Summary

This was a quantitative study attempting to explore the effect of an independent variable, size, on selected dependent variables, outcome indicators. The subjects in the study were middle schools. Random selection of the middle schools was made within the two identified subsets of the total population on middle schools in the state of Virginia. The five largest and smallest middle schools in the state were restricted from inclusion in order to remove the effect of outliers which could affect the outcomes due to their extreme size. A sample of ten of the largest and ten of the smallest middle schools were included to heighten the chance of capturing the desired effects of size on the selected dependent variables.

A single covariate, the participation in free/reduced lunch program as an indicator of the socioeconomic status of the community, was used to control for differences in outcome variables of the schools selected for inclusion in the study. The covariate was used to remove that portion of the variance in the selected dependent variables which may be derived from socioeconomic differences. The SES was a proxy that was used to measure the number of students in the school who are enrolled in the free and reduced lunch program.

To study the effects of school size on the selected depended variables, ANCOVA was used because it is able to reduce systematic bias, reduce the error term, and improve the accuracy of conclusions (Holler,1995). Howell (1987) indicated that the error term is reduced through the use of ANCOVA by adjusting the means of the dependent variable due to the effects of the covariate. He adds that ANCOVA includes some basic assumptions. Group scores are normally distributed, homogeneity of the group variances, and a linear relationship between the dependent variable and the covariate are the major assumptions.

The seven outcome indicators and the dependent variables were reported descriptively in means, standard deviations, and percentages. Separate ANCOVA tests were performed for each. The Statistical Package of the Social Sciences (SPSS) was used for all analysis of data. The level of significance was set at the .05 probability. Tables were produced to report all descriptive data.

CHAPTER FOUR

Findings

When all information needed from the middle schools selected for inclusion in the study, and all the information from the Virginia Department of Education 1994-1995 Outcome Accountability Project reports had been collected, analysis of the data began. The data were first consolidated into a manageable format by organizing them on a spread sheet. Two spread sheets,one for small middle schools (Appendix C) and one for large middle schools(Appendix D), were used. These data were coded for analysis and entry into the computer. This provided all of the necessary structure needed for the chosen method of statistical analysis.

The statistical comparisons of large and small middle schools are presented in this chapter. The efficiency and effectiveness of middle schools were represented by seven indicators,which were the focus of the analysis. The seven indicators were tested independently from each other. Seven research questions were set forth to be tested in attempting to assess the effect of school size on the various indicators. Each research question was tested in accordance with the purpose of the study as reported previously. The results of these tests are reported here.

Each of the seven research questions posed in this study was tested twice. The statistical method used to determine the significance of school size in relation to the seven indicators was analysis of covariance, ANCOVA. This test of significance requires that a covariate be used to account for some of the variance in the indicators. The covariate should have a relationship with the measured indicators. In this study, a socioeconomic indicator, the number of students in the school enrolled in the free and reduced lunch program, has been used as the covariate.

The findings are presented in the following order:

1.   Attendance indicator

    A. The percentage of students who missed ten or fewer days of school in the 1994-95 school year.

2.   Curriculum indicators

    A. The percentage of 8th grade students who took a foreign language prior to the 9th grade.

    B. The percentage of minority 8th grade students who took a foreign language prior to the 9th grade.

    C. The percentage of 8th grade students who took Algebra I or Algebra I, Part I prior to the 9th grade.

D. The percentage of minority 8th grade students who took Algebra I or Algebra I, Part I prior to the 9th grade.

3.   Student achievement indicators

A. The percentage of students who are at or above the 75th percentile on the composite score of the 8th grade Virginia State Assessment Program standardized test in school year 1994-95.

B. The percentage of students who are at or above the 50th percentile on the composite score of the 8th grade Virginia state Assessment Program Standardized test in school year 1994-95.

Section One: School Attendance

The Percentage of Students Who Miss Ten or Fewer Days of School in 1994-95

This section of the study examined the relationship of school size with the percentage of students who miss ten or fewer days of school in 1994-95. The research question to be answered was: Does the size of a middle school relate to differences in the percentage of students who miss ten or fewer days of school in 1994-95?

Ten schools were included in the sample of small schools. The mean for the small school sample was 68.90 percent of students who missed ten or fewer days of school in 1994-95. The range in the percentage reported was 24, from 55 to 79 percent. The standard deviation was 8.05 percentage points. Ten schools were included in the sample of large schools. The mean for the large school sample was 73.60 percent of students who miss ten or fewer days of school in 1994-95. The range in the percentage reported was 34, from 54 to 88 percent. The standard deviation was 8.46 percentage points.

The adjusted and unadjusted mean differences are represented in Table 1. The differences in the means of the large schools and the small schools decreased from 4.7 percent to 2.4 percent when socioeconomic

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differences were used as a covariate. An analysis of covariance was computed using these mean differences and the findings are reported in Table 2. A probability of 0.6325 was obtained from the statistical analysis, indicating a non-significant relationship. These data do not support that there is a significant difference between large middle schools and small middle schools in the state of Virginia in the percentage of students who miss ten or fewer days of school in 1994-95.

Table 1

Unadjusted and Adjusted Means - Student Attendance in Random Schools

	Mean Differences	
Group	Unadjusted Mean	Adjusted Mean
Small schools	68.90	70.45
Large schools	73.60	72.05
Difference	4.7	2.4

Table 2

Analysis of Covariance

	Summary of Results		
Source of Variation	d.f.	s.s.	M.S.
Total	18	811.53	
Within Groups	17	800.05	47.06
Difference	1	11.49	11.49
$F=0.24$, $P=0.6325*$			

*Not Significant

Section Two: Foreign Language

The Percentage of 8th Grade Students Who Took a Foreign Language Prior to the 9th grade.

This section of the study examined the relationship of school size with the percentage of students who took a foreign language prior to the 9th grade. The research question to be answered was: Does the size of a middle school relate to differences in the percentage of 8th grade students who took a foreign language prior to the 9th grade?

Ten schools were included in the sample of small schools and in the sample for large schools. The mean for the small school sample was 37.30. The range in the percentage reported was 71, from 16 to 87 percent. The standard deviation was 20.14 percentage points. The mean for the large school sample was 46.90 percent of students who took a foreign language. The range in the percentage reported was 34, from 26 to 60 percent. The standard deviation was 11.70 percentage points.

The adjusted and unadjusted mean differences are presented in Table 3. The differences in the means of the large schools and the small schools decreased from 9.6 to 2.86 percent when socioeconomic differences were used as a covariate. An analysis of covariance was computed using these mean differences and the findings are reported in Table 4. A probability of

0.6506 was obtained from the statistical analysis, indicating a non-significant relationship. These data do not support that there is a significant difference between large and small middle schools in the state of Virginia in the percentage of students who took a foreign language prior to the 9th grade.

Table 3

Unadjusted and Adjusted Means - Students Taking Foreign Language

Group	Mean Differences	
	Unadjusted Mean	Adjusted Mean
Small schools	37.30	40.67
Large schools	46.90	43.53
Difference	9.6	2.86

Table 4

Analysis of Covariance

Source of Variation	Summary of Results		
	d.f.	s.s.	M.S.
Total	18	2903.86	
Within Groups	17	2867.10	168.65
Difference	1	36.76	36.76
F=0.22, P=0.6506*			

*Not Significant

Section Three: Foreign Language

The Percentage of Minority 8th Grade Students Who Took a Foreign Language Prior to the 9th Grade

This section of the study examined the relationship of school size with the percentage of minority 8th grade students who took a foreign language prior to the 9th grade. The research question to be answered was: Does the size of a middle school relate to differences in the percent of minority 8th grade students who took a foreign language prior to the 9th grade?

Ten schools were included in the sample of small schools. The mean for the small school sample was 20.20 percentage points. The range in the percentage reported was 78, from 0 to 78 percent of minority 8th grade students who took a foreign language prior to the 9th grade. The standard deviation was 23.11 percentage points. Ten schools were included in the sample of large schools. The mean for the large school sample was 37.40 percent of the minority 8th grade students who took a foreign language prior to the 9th grade. The range in the percentage reported was 41, from 22 to 63 percent. The standard deviation was 12.46 percentage points.

The adjusted and unadjusted mean differences are presented in Table 5. The differences in the means of the large schools and small schools

decreased from 17.2 to 11.18 percent when socioeconomic differences were used as a covariate. An analysis of covariance was computed using these mean differences and the findings are reported in Table 6. A probability of 0.1647 was obtained from the statistical analysis, indicating a non-significant relationship. These data do not support that there is a significant difference between large middle schools and small middle schools in the state of Virginia in the percentage of minority 8th grade students taking a foreign language prior to the 9th grade.

Table 5

Unadjusted and Adjusted Means - Minority Students Taking a Foreign Language in Random Schools

Group	Mean Differences	
	Unadjusted Mean	Adjusted Mean
Small schools	20.20	23.21
Large schools	37.40	34.39
Difference	17.2	11.18

Table 6

<u>Analysis of Covariance</u>

Source of Variation	Summary of Results		
	d.f.	s.s.	M.S.
Total	18	5155.34	
Within Groups	17	4593.70	270.22
Difference	1	561.64	561.64
F=2.08, P=0.1647*			

*Not Significant

Section Four: Students Taking Algebra

The Percentage of Students Taking Algebra I or Algebra I, Part I, Prior to the 9th Grade

This section of the study examined the relationship of school size with the percentage of students taking Algebra I or Algebra I, Part I, prior to the 9th grade. The research question to be answered was: Does the size of a middle school relate to the percentage of students taking Algebra I or Algebra I, Part I, prior to the 9th grade?

Ten schools were included in the sample of small schools and in the sample of large schools. The small school sample had a mean of 27.90 percent of students who take Algebra I or Algebra I, Part I, prior to the 9th grade. The range in percentages reported was 54, from 8 to 62 percent.

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The standard deviation was 16.56 percentage points. The large school sample had a mean of 26.40 percent of students who take Algebra I or Algebra I, Part I, prior to the 9th grade. The range in the percentages reported was 33, from 8 to 41 percent. The standard deviation was 10.62 percentage points.

The adjusted and unadjusted mean differences are presented in Table 7. The differences in the means of the large schools and the small schools increased from 1.5 to 5.4 percent when socioeconomic differences were used as a covariate. An analysis of covariance was computed using these mean differences and the findings are reported in Table 8. A probability of 0.3957 was obtained from the statistical analysis, indicating a non-significant relationship. These data do not support that there is a significant difference between large middle schools and small middle schools in the state of Virginia in the percentage of students taking Algebra I or Algebra I, Part I, prior to the 9th grade.

Table 7

Unadjusted and Adjusted Means - Percentages of Students Who Take Algebra I, or Algebra 1, Part 1, Prior to the 9th Grade.

	Mean Differences	
Group	Unadjusted Mean	Adjusted Mean
Small schools	27.90	29.85
Large schools	26.40	24.45
Difference	1.50	5.40

Table 8

Analysis of Covariance

	Summary of Results		
Source of Variation	d.f.	s.s.	M.S.
Total	18	2936.04	
Within Groups	17	2806.88	165.11
Difference	1	131.16	131.16
F=0.79, P=0.3957*			

*Not Significant

Section Five: Minority Students Taking Algebra

The Percentage of Minority Students Taking Algebra I or Algebra I, Part I,

Prior to the 9th Grade

This section of the study examined the relationship of school size with the percentage of minority students taking Algebra I or Algebra I, Part I, prior to the 9th grade. The research question to be answered was: Does

the size of a middle school relate to differences in the percentages of minority students taking Algebra I or Algebra I, Part I, prior to the 9th grade?

Ten schools were included in the sample of small schools and in the sample of large schools. The small school sample had a mean of 6.70 percent of minority students who take Algebra I or Algebra I, Part I, prior to the 9th grade. The range in percentages reported was 13, from 0 to 13 percent. The standard deviation was 5.23 percentage points. The large school sample had a mean of 17.60 percent of minority students who took Algebra I or Algebra I, Part I, prior to the 9th grade. The range in the percentages reported was 33, from 5 to 38 percent. The standard deviation was 9.90 percentage points.

The adjusted and unadjusted mean differences are presented in Table 9. The differences in the means of the large schools and the small schools decreased from 10.9 to 10.02 percent when socioeconomic differences were used as a covariate. An analysis of covariance was computed using these mean differences and the findings are reported in Table 10. A probability of 0.0161 was obtained from the statistical analysis, indicating a significant relationship. The data supports that there is a significant difference between large middle schools and small middle schools in the

state of Virginia in the percentages of minority students who take Algebra I
or Algebra I, Part I, prior to the 9th grade.

Table 9

Unadjusted and Adjusted Means - Percentages of Minority Students Who Took
Algebra I or Algebra I, Part 1, Prior to the 9th Grade

Group	Mean Differences	
	Unadjusted Mean	Adjusted Mean
Small schools	6.70	7.14
Large schools	17.60	17.16
Difference	10.9	10.02

Table 10

Analysis of Covariance

Source of Variation	Summary of Results		
	d.f.	s.s.	M.S.
Total	18	1546.76	
Within Groups	17	1094.77	64.40
Difference	1	451.99	451.99
F=7.02, P=0.0161*			

*Significant

Section Six: Composite Test Score

The Percentage of Students Who are At or Above the 75th Percentile on the Composite score of the 8th Grade Virginia State Assessment Program Standardized Test in School Year 1994-95.

This section of the study examined the relationship of school size with the percentage of students who are at or above the 75th percentile on the composite score of the 8th grade Virginia State Assessment Program standardized test in school year 1994-95. The research question to be answered was: Does the size of a middle school relate to differences in the percentage of students who are at or above the 75th percentile on the composite score of the 8th grade Virginia State Assessment Program standardized test in school year 1994-95?

Ten schools were included in the sample of small schools and in the sample of large schools. The mean for the small school sample was 26 percent of students who are at or above the 75th percentile on the composite score of the 8th grade Virginia State Assessment Program standardized test in school year 1994-95. The range in the percentage reported was 50, from 7 to 57 percent. The standard deviation was 13.82 percentage points. The mean for the large school sample was 35.20 percent of students who are at or above the 75th percentile on the

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composite score of the 8th grade Virginia State Assessment Program standardized test in school year 1994-95. The range in the percentage reported was 49, from 8 to 57 percent. The standard deviation was 15.25 percentage points.

The adjusted and unadjusted mean differences are presented in Table 11. The differences in the means of the large schools and the small schools decreased from 9.2 to 2.36 percent when socioeconomic differences were used as a covariate. An analysis of covariance was computed using these mean differences and the findings are reported in Table 12. A probability of 0.6318 was obtained from the statistical analysis, indicating a non-significant relationship. These data do not support that there is a significant difference between large middle schools and small middle schools in the state of Virginia in the percentage of students who are at or above the 75th percentile on the composite score of the 8th grade Virginia State Assessment program standardized test in school year 1994-95.

Table 11

Unadjusted and Adjusted Means - Composite Test Score in Random Schools

Group	Mean Differences	
	Unadjusted Mean	Adjusted Mean
Small schools	26	29.42
Large schools	35.20	31.78
Difference	9.2	2.36

Table 12

Analysis of Covariance

Source of Variation	Summary of Results		
	d.f.	s.s.	M.S.
Total	18	1756	
Within Groups	17	1731.05	101.83
Difference	1	24.95	24.95
F=0.25, P=0.6318*			

*Not significant

Section Seven: Composite Test Scores

The Percentage of Students Who Are at or Above the 50th Percentile on the Composite Score of the 8th Grade Virginia State Assessment Program Standardized Test in School Year 1994-95

This section of the study examined the relationship of school size with the percentage of students who are at or above the 50th percentile on the composite score of the 8th grade Virginia State Assessment Program standardized test in school year 1994-95. The research question to be answered was: Does the size of a middle school relate to differences in the percentage of students who are at or above the 50th percentile on the composite score of the 8th grade Virginia State assessment Program standardized test in school year 1994-95.

Ten schools were included in the sample of small schools and in the sample of large schools. The mean for the small school sample was 50.30 percent of students who are at or above the 50th percentile on the composite score of the 8th grade Virginia State Assessment Program standardized test in school year 1994-95. The range in the percentage reported was 55, from 24 to 79 percent. The standard deviation was 15.09 percentage points. The mean for the large school sample was 61.20 percent of students who are at or above the 50th percentile on the

composite score of the 8th grade Virginia State Assessment Program standardized test in school year 1994-95. The range in the percentage reported was 53, from 31 to 84 percent. The standard deviation was 16.96 percentage points.

The adjusted and unadjusted mean differences are presented in Table 13. The differences in the means of the large schools and the small schools decreased from 10.9 to 2.6 percent when socioeconomic differences were used as a covariate. An analysis of covariance was computed using these mean differences and the findings are reported in Table 14. A probability of 0.5804 was obtained from the statistical analysis, indicating a non-significant relationship. These data do not support that there is a significant difference between large middle schools and small middle schools in the state of Virginia in the percentage of students who are at or above the 50th percentile on the composite score of the 8th grade Virginia State Assessment Program standardized test in school year 1994-95.

Table 13

Unadjusted and Adjusted Means - Composite Test Score in Random Schools

Group	Mean Differences	
	Unadjusted Mean	Adjusted Mean
Small schools	50.30	54.45
Large schools	61.20	57.05
Difference	10.9	3.40

Table 14

Analysis of Covariance

Source of Variation	Summary of Results		
	d.f.	s.s.	M.S.
Total	18	1607.55	
Within Groups	17	1577.12	92.77
Difference	1	30.43	30.43
F=0.33, P=0.5804*			

*Not Significant

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter includes a summary, conclusions, and a discussion of the research. It concludes with a set of recommendations for future study.

This study examined the effect of school size on a set of input and outcome indicators from middle schools in the state of Virginia. It provides evidence that the size of middle schools is not related to certain indicators of school effectiveness.

The study examined seven measures of school effectiveness to determine if school size is a significant factor affecting school effectiveness. The seven indicators are:The percentage of students in grades 6-8 who were absent 10 days or less from school, the percentage of 8th grade students who took a foreign language prior to the 9th grade, the percentage of minority 8th grade students who took a foreign language prior to the 9th grade, the percentage of 8th grade students who took Algebra I or Algebra I, Part I prior to the 9th grade, the percentage of minority 8th grade students who took Algebra I or Algebra I, Part I prior to the 9th grade, the percentage of 8th grade students who took the Virginia State Assessment Program standardized tests whose composite scores were above the national 75th percentile, and the percentage of 8th grade

students who took the Virginia State Assessment Program standardizes tests whose composite scores were above the national 50th percentile.

The schools used in the study came from identified sets of small and large middle schools in the state of Virginia. Small middle schools, those with school memberships under 400 students, numbered nineteen, and large middle schools, those with school memberships over 1000 students, numbered fifty-six. A sample of ten schools from each group was compared in this study. Separate analysis of covariance (ANCOVA) tests were used for each indicator of educational input or outcome. A socioeconomic status index, the percentage of students enrolled in the Federal Free or Reduced Lunch Program was used as a covariant in all of the tests. The Statistical Package for the Social Sciences (SPSS) software was utilized for all computations.

By assessing and reporting the association of school size and educational input and indicators in Virginia's middle schools, the results may be helpful in an attempt to end educational disparity, assess the need to restructure schools, and examine state funding considerations.

<div align="center">

Summary of Findings

</div>

The following are specific findings associated with several of the areas identified by Melnick (1986). They identified these areas where advantages can be claimed by either small or large schools. These areas include: Attendance, Curriculum, and Achievement.

<u>Attendance</u>

School size can be a major factor contributing to students' sense of anonymity and alienation. Often, many adolescents withdraw into themselves and tend to make excuses as to why they do not want to attend school. Typically, students leave small, feeder elementary schools for much larger and more impersonal middle schools. Overwhelming school size often combine with large class size and leaves many elementary students without a strong sense of place or belonging. This is but one reason given by many middle schoolers to be absent from school.

There was not a statistical difference attributable to size between large middle schools and small middle schools in Virginia with the attendance indicator of the percentage of students who miss ten or fewer days of school in 1994-95. The extent of the difference between the small middle schools and the large middle schools can be shown through the sample means. The large and small school sample means of the percent of

students who missed ten or fewer days of school in the 1994-95 school year differed by 2.4 percent when socioeconomic differences were used as a covariate. The small school sample was 70.45 percent and the large school sample mean was 72.05 percent.

Curriculum

There is not a statistically significant difference between large middle schools and small middle schools in Virginia in the following curriculum indicators: the percent of 8th grade students who took a foreign language prior to the 9th grade, the percent of minority 8th grade students who took a foreign language prior to the 9th grade, and the percent of 8th grade students who took Algebra I or Algebra I, Part I prior to the 9th grade. There is a statistically significant difference between large middle schools and small schools in Virginia in the curriculum indicator in the percent of minority 8th grade students who took Algebra I or Algebra I, Part I prior to the 9th grade.

The extent of the difference between the small middle schools and the large middle schools in curriculum can be shown through the sample means. The large and small school sample means of the percent of 8th grade students who took a foreign language prior to the 9th grade differed

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by 2.86 percent when socioeconomic differences were used as a covariate. The small school sample mean was 40.67 percent and the large school sample mean was 43.53 percent. The large and small school sample means of the percent of minority 8th grade students who took a foreign language prior to the 9th grade was 11.18 percent when socioeconomic differences were used as a covariate. The small school sample mean was 23.21 percent and the large school sample mean was 34.39 percent. The large and small school sample means of the percent of 8th grade students who took Algebra I or Algebra I, Part I prior to the 9th grade differed by 5.4 percent when socioeconomic differences were used as a covariate. The small school sample mean was 29.85 percent and the large school sample mean was 24.45 percent. The large and small school sample means of the percent of minority 8th grade students who took Algebra I or Algebra I, Part I, prior to the 9th grade differed by 10.02 percent when socioeconomic differences were used as a covariate. The small school sample was 7.14 percent and the large school sample was 17.16 percent.

When it comes to effectiveness in curriculum packaging and delivery, small schools have often been criticized for not being able to offer a full menu of advanced and specialty courses. Reasons for this may range from a lack of building space and financial resources to inadequate staffing.

However, according to some researchers, small schools provide a more conducive environment for implementing curricular change. Worthwhile curriculum change demands a stable climate, and small schools have proved to be the more stable (Imhoff and Taylor,1980).

Genge (1994) concluded that size does have a great influence on courses offered, especially in the area of supportive classes, those for lower and upper level students. He also indicated that course offerings are skewed by overall wealth of the school district. Wealthy districts are able to provide more course offerings than less wealthy districts no matter what size.

Achievement

There is not a statistically significant difference between large middle schools and small middle schools in Virginia in the indicators of student achievement examined in the study. There was no statistical difference in the percentage of students who were on level or above the 75th percentile on the composite score of the 8th grade Virginia State Assessment Program standardized test in school year 1994-95, and the percentage of students who are at or above the 50th percentile on the composite score of the 8th grade Virginia State Assessment Program standardized test in school year 1994-95.

The extent of the difference between the small middle schools and large middle schools in achievement can be shown through the sample means. The large and small school sample means of the percentage of students at or above the 75th percentile on the composite score of the 8th grade Virginia State Assessment Program standardized test in school year 1994-95 was 2.36 percent when socioeconomic differences were used as a covariate. The small school sample mean was 29.42 percent and the large school sample mean was 31.78 percent. The large and small school sample means of the percentage of students who are at or above the 50th percentile on the composite score of the 8th grade Virginia State Assessment Program standardized test in school year 1994-95 was 2.6 percent when socioeconomic differences were used as a covariate. The small school sample had a mean of 54.45 percent and the large school sample had a mean of 57.05 percent.

Friedkin and Necochea (1988) found that students in low SES communities performed much better in small schools, whereas students in high SES communities performed somewhat better in large schools. Studies by Melnick (1986) and Edington and Martellaro (1990) found no significant relationship between school size and academic achievement. Student achievement as measured by standardized tests was neither better nor

worse in smaller schools when compared to schools with more students. Studies repeatedly found that differences in achievement were attributable to socioeconomic factors, English language proficiency, cultural and ethnic factors, and per-pupil expenditures. Howley (1989) reviewed several studies and found no support to recommend increases in school size to influence improvement in achievement. The author reported that lower achievement was found in large schools and school districts in low SES areas, but achievement was not negatively affected by large school size in high SES areas. Overall, studies on the effect of small scale schooling on achievement confirms that there are no systematic overall negative effects of small schools on student achievement.

Discussion

The major issue of this study was the relationship of school size to school effectiveness. Variables such as the number of students in a particular input or the amount of students in a particular area certainly favor the large middle schools. Fonstat (1973) and Nelson (1985) found that large schools possess more resources than smaller schools. This study has shown however,that outcomes are not statistically significant in small or large middle schools.

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The geographic question of whether the schools identified in this study were located in rural areas or urban areas produced no surprises. Generally, the small schools were in rural areas and the large schools were in urban settings. The small schools were located in areas where consolidation with the high school was a necessity in most cases due to distance or scarcity of staff and students. The limitation of curriculum offerings in small schools has a correlation with economy of scale.

McGuffy and Brown (1978) supported the claim that larger schools are cheaper to operate. Larger schools had a lower per-pupil operational cost than did small schools. Regardless of size, schools that operate at or near design capacity are more efficient in terms of per-pupil cost. However,educators have been concerned about large schools at capacity size and see trade-offs in terms of student achievement, opportunities for more students to participate in sports or other activities, and adolescent development.

Barker and Gump (1964) found that small schools seemed to facilitate social-cognitive development, identity formation, the establishment of multiple and diverse friendships, and autonomous self-expression. Diverse and multiple activities require students to take and reflect upon

multiple social roles which encourage and prepare the student for the world beyond the classroom.

Some researchers have examined alternative school organizations which are intended to address the developmental and psychosocial needs of adolescents. Burke (1987) investigated the advantages of the school- within- a- school concept for middle schools, which, in effect, makes large schools seem small so that they have more in common with a typical K-5 school than with a grade 10-12 high school. The advantage of breaking a medium or large sized school into smaller sub-units called "houses" is that it tends to personalize teaching and learning. The basic concept is that smallness fosters closer relationships between students and staff, more opportunities to focus on psychological as well as academic development, and more opportunities for student participation in activities. Burke also cited evidence to the effect that the school- within- a- school programs have been shown to produce significant achievement growth, to improve attendance and behavior, and to generate student, staff, and parent satisfaction. Success is attributed to benefits of choice, climate, size, degree of staff autonomy, and a culture which emphasizes experimentation.

The reality is that the benefits of being a small or large middle school do not show up in measured outcomes used in this study. Being large or

small is not an advantage or disadvantage. In addition, community attitudes about schools were not included as a part of the study. Holler (1994) stated that the debate about school size migrates between two points. Large schools provide a more comprehensive program and small schools provide a more positive environment. The eventual decision on which is more important, program or environment, is yet to be resolved. The reality of school size seems to be a function of local economics and population density in an area rather than a commitment to either environment or program.

Conclusions

The study produced evidence that no significant difference was found between small middle schools and large middle schools in six of the seven indicators from the Virginia OAP. Only in the area of the percentage of minority students taking Algebra I or Algebra I, Part I prior to the 9th grade was a significant difference found between large and small middle schools. The number of minority students in a district or the economic background of the community could be a reason for this conclusion.Large middle schools were not found to be at a disadvantage in any of the indicators included.

Study Concerns

Holler (1995) stated that the use of Free and Reduced Lunch percentages as a covariate has been maligned in the literature for some time. It is accepted as the most widely available proxy for socioeconomic status, and it is the most used SES variable in research. The variable continues to be used because other measures of SES are not readily available.The hope of all researchers using Free and Reduced Lunch percentages is that the student and parent choice in participation is an evenly distributed phenomena throughout the country. Many middle schools do not have freedom of choice in allowing students a choice to buy lunch on campus or off campus. Parents use Free and Reduced Lunch as a means of providing lunch. The stigma of being on Free and Reduced Lunch is not as great with middle school students as with high school students.

The information requested for the middle schools came from three formats: Virginia Department of Education OAP reports, the yearly Free and Reduced lunch counts and memberships that are sent by each school division to the Department Of Education yearly, and individual telephone calls to some divisions to get specific data. In some cases,specific data from some of the small school divisions had to be disseminated between schools within the division. When the school division information was

collected, the middle school free and reduced lunch data was combined with that of the high schools. This necessitated a call to the individual division to determine the separation between the middle school and the high school for that specific data. In all of the cases, the information was obtained either from the building manager in charge of the lunch program or the central office person incharge of sending the report to the state department. All were very helpful and supplied the data immediately. In no instance was a school division called more than once for these data.

Recommendations for Further Study

1. Examine student participation in a range of student activities across the school size continuum. Indicators in this study should concentrate on a set of non-athletic activities, especially the middle school intramural program. Athletics offers a set number of students who can participate because of team size. However, the very existence of other student organizations and the membership in them may provide more information on program disparity which is associated with school size. Areas which are identified as strengths of small middle schools, such as intramural and activity participation, student-faculty relations, community relations,

atmosphere in the school, and student safety should be examined as variables in a study.

2. The impact of wealth within the district should be investigated. Schools in wealthy districts are able to provide a wider range of encore/electives (foreign languages), thereby providing more opportunities to the students. The use of the electives was examined in two of the indicators. Also, wealthy districts may be able to provide for more teachers in a building, thereby having small classes which may allow for greater academic success.

3. Examine class size as well as school size. A small school could have large class sizes which affect achievement, just as a large middle school could provide for small classes which affect achievement.

4. Two areas of strength for which small schools are given the most credit are environment and individual attention afforded to students. Questions concerning the ability and accuracy of measurements of these attributes, such as the differences between rural versus urban schools, must be addressed in any study related to them and student achievement. Both are worthwhile areas of study and worthy of further research.

5. Examine the possibility of replicating this study by adding more schools to the study. This will allow for additional research with the variables.

6. The geographical differences between rural and urban middle schools and their academic achievement differences should be examined.

7. A study should be conducted to determine the prevalent strengths of small schools.

8. Examine schools with a greater grade variance, such as 5-8 middle schools, to determine their academic success using the OAP data.

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APPENDIX A
Small Middle Schools In Virginia

SMALL MIDDLE SCHOOLS IN VIRGINIA
Those with school enrollments of less than 1000 students in June, 1995

CT	SCHOOL	ENROLL	DIVISION	ADDRESS
1	Lyburn Dowing	161	Lexington	300 Diamond St. Lexington, 24450
	Central	223	Accomack	P.O. Box 10. Painter, 23420
	Parry McCluer	244	Buena Vista	2329 Chestnut, Buena Vista, 24416
	Cumberland	268	Cumberland	P.O. Box 184, Cumberland, 23040
	Rockbridge	271	Rockbridge	P.O. Box 328, Fairfield, 24435
	William Campbell	280	Campbell	P.O. Box 7, Naruna, 24576
	Charles City County	287	Charles City	10035 Courthouse Rd., Charles City, 23030
	Galax	290	Galax	Maroon Tide Dr., Galax, 24333
	St. Clare Walker	304	Middlesex	P.O. Box 9, Locust Hill, Va. 23092
10	Independence	318	Grayson	P.O. Box 155, Independence, 24292-9726
	Richmond County	320	Richmond County	P.O. Box 519, Warsaw, 22572
	Sussex Central	329	Sussex	P.O. Box 1387, Sussex, 23884
	Elkton	329	Rockingham	401 Blue & Gold Dr., Elkton, 22827
	George Mason	323	Falls Church	7124 Leesburg Pike, Falls Church, 22043
	Glade Spring	367	Washington	33474 Stage Coach Rd., Glade Spring, 24340
	Breckinridge	362	Roanoke City	3901 Williamson Rd., NW, Roanoke, 24012
	Berkeley	388	Williamsburg	1118 Ironbound Rd., Williamsburg, 23185
	Northumberland	394	Northumber-land	P.O. Box 100, Heathsville, 22473
19	Goochland	400	Goochland	P.O. Box 79, Goochland, 23063

APPENDIX B
Large Middle Schools In Virginia

LARGE MIDDLE SCHOOLS IN VIRGINIA
Those with school enrollments of more than 1000 students in June, 1995

CT	SCHOOL	ENROLL	DIVISION	ADDRESS
1	Sterling	1010	Loudoun	201 W. Holly Ave., Sterling, 20164
	Stonewall Jackson	1016	Hanover	8525 Lee Davis Rd. Mechanicsville, 23111
	Huntington	1018	Newport News	3401 Orcutt Ave., Newport News, 23607
	Azalea	1026	Norfolk	7721 Azalea Gardens Rd., Norfolk,23518
	Fairfield	1029	Henrico	5121 Nine Mile Rd., Richmond, 23223
	George Washington	1034	Alexandria	1005 Mt. Vernon Ave., Alexandria 22301
	Warren County	1048	Warren	15th St., Front Royal, 22630
	Liberty	1059	Hanover	Rt. 3, Box 2500, Ashland, 23005
	Manchester	1062	Chesterfield	7401 Hull St. Rd., Richmond, 23235
10	Moody	1050	Henrico	7800 Woodman Rd., Richmond, 23228
	Francis C. Hammond	1066	Alexandria	4646 Seminary Rd., Alexandria, 22304
	Tuckahoe	1069	Henrico	9000 Three Chopt Rd., Richmond, 23229
	Virginia Beach	1074	Virginia Beach	600 25th St., Virginia Beach, 23451
	C. Vernon Spratley	1078	Hampton	339 Woodland Rd., Hampton, 23669
	Salem Church	1089	Chesterfield	9700 Salem Church Rd., Richmond 23237
	Falling Creek	1097	Chesterfield	4724 Hopkins Rd., Richmond, 23234
	Andrew G. Wright	1097	Stafford	100 Wood Dr., Stafford, 22554
	Norview	1098	Norfolk	6325 Sewells Point Rd., Norfolk, 23513
	Chickahominy	1100	Hanover	10441 Atlee Station Rd., Mechanicsville, 23111
20	Northside	1107	Norfolk	8720 Granby St., Norfolk, 23503
	Swift Creek	1134	Chesterfield	3700 Old Hundred Rd., Midlothian, 23112
	Blair	1130	Norfolk	730 Spottswood Ave., Norfolk, 23517
	Bailey Bridge	1131	Chesterfield	12501 Bailey Bridge Rd., Midlothian, 23112
	Fred M. Lynn	1131	Prince William	2451 Longview Dr., Woodbridge,22191
	Tabb	1141	York	300 Yorktown Rd., Yorktown, 23693
	Robious	1144	Chesterfield	2701 Robious Crossing Dr., Midlothian, 23113
	Lafayette	1171	Norfolk	1701 Alsace Ave., Norfolk, 23509
	Herbert J. Saunders	1177	Prince William	13557 Spriggs Rd., Manassas, 22111
	Churchland	1186	Portsmouth	4051 River Shore Rd., Portsmouth, 23703
30	Great Neck	1199	Virginia Beach	1848 Great Neck Rd., Virginia Beach, 23454
	Lake Ridge	1204	Prince William	10350 Mohican Rd., Woodbridge, 22192
	Short Pump	1204	Henrico	4701 Pouncy Tract Rd., Glen Allen,23060
	Rolfe	1220	Henrico	6901 Messer Rd., Richmond 23231
	Stafford	1222	Stafford	101 Spartan Dr., Stafford, 22554
	Midlothian	1227	Chesterfield	13501 Midlothian Pike, Midlothian, 23113

	Hunt/Mapp	1241	Portsmouth	3701 Willett Dr., Portsmouth, 23707-1201
	Jefferson Davis	1259	Hampton	1435 Todds Ln., Hampton, 23666
	Seneca Ridge	1272	Loudoun	98 Seneca Ridge Dr., Sterling 22164
	J. M. Dozier	1281	Newport News	432 Industrial Park Dr., Newport News, 23602
	Indian River	1273	Chesapeake	2300 Greenbrier Rd., Chesapeake, 23325
	Kempsville	1306	Virginia Beach	860 Churchill Dr., Virginia Beach, 23462
	Benjamin Syms	1317	Hampton	170 Fox Hill Rd., Hampton, 23669
	Brookland Middle	1340	Henrico	9200 N. Lydell Dr. Richmond, 23228
	Western Branch	1363	Chesapeake	4201 Hawksley Dr., Chesapeake, 23322
	Independence	1398	Virginia Beach	1370 Dunstan Ln., Virginia Beach 23455
	Ethel M. Gildersleeve	1414	Newport News	One Minton Dr., Newport News, 23606
	Salem	1425	Virginia Beach	2380 Lynnhaven Pkwy., Virginia Beach, 23462
	Lynnhaven	1456	Virginia Beach	1250 Bayne Dr., Virginia Beach 23454
	Plaza	1471	Virginia Beach	3080 S. Lynnhaven Rd., Virginia Beach, 23452
50	Byrd	1498	Henrico	9400 Quioccasin Rd., Richmond, 23223
	Homer L. Hines	1536	Newport News	561 Mclawhorne Dr., Newport News 23601
	Bayside	1538	Virginia Beach	965 Newtown Rd., Virginia Beach, 23462
	Princess Anne	1549	Virginia Beach	2509 Seaboard Rd., Virginia Beach, 23456
	Larkspur	1578	Virginia Beach	4696 Princess Anne Rd., Virginia Beach, 23462
	Brandon	1675	Virginia Beach	1700 Pope St., Virginia Beach, 23462
56	Landstown	2049	Virginia Beach	2204 Recreation Dr., Virginia Beach, 23456

APPENDIX C

Small Middle School Statistics

Small Middle School Data
(Legend Follows)

SCHOOL	Enroll	FRL	Att	Fl	Flms	Alg	Algms	75 per	50 per
William Campbell	280	121	62	45	30	25	5	20	48
Galax	290	100	76	30	1	62	1	37	61
Independence	318	92	75	29	0	27	0	19	49
George Mason	323	52	79	87	78	50	9	57	79
Sussex Central	329	235	55	16	13	17	12	7	24
Breckinridge	362	149	63	19	17	8	5	27	52
Glade Spring	367	150	62	34	0	18	0	18	39
Berkeley	388	91	77	49	26	34	13	34	64
Northumberland	394	195	69	30	12	19	13	21	44
Goochland	400	81	71	34	25	19	9	20	43

Legend

Enroll	The total school membership during the 1994-95 school year.
FRL	The number of students in the free and reduced lunch program in 1994-1995.
Att	The percentage of students who missed ten or fewer days of school in the 1994-1995 school year.
Fl	The percentage of 8th grade students who took a foreign language prior to the 9th grade.
Flms	The percentage of minority 8th grade students who took a foreign language prior to the 9th grade.
Alg	The percentage of 8th grade students who took Algebra I, or Algebra I, part I, prior to the 9th grade.
Flalg	The percentage of minority 8th grade students who took Algebra I, or Algebra I, part I, prior to the 9th grade.
75 per	The percentage of 8th grade students who took the Virginia State Assessment Program standardized tests under standard conditions whose composite scores were above the national 75th percentile.
50 per	The percentage of 8th grade students who took the Virginia State Assessment Program standardized tests under standard conditions whose composite scores were above the national 50th percentile.

APPENDIX D

Large Middle School Statistics

Large Middle School Data

(Legend Follows)

SCHOOL	Enroll	FRL	Att	Fl	Flms	Alg	Algms	75 per	50 per
George Washington	1034	565	74	41	30	29	17	27	44
Moody	1050	469	54	26	22	17	16	8	31
Tuckahoe	1069	156	75	53	39	33	8	57	84
Swift Creek	1134	34	79	60	63	37	31	55	82
Short Pump	1204	172	76	58	49	41	38	46	71
Indian River	1273	309	75	35	31	8	5	24	51
Benjamin Syms	1317	473	88	46	47	20	14	29	55
Brookland	1340	365	71	37	29	21	14	26	55
Independence	1398	356	73	58	37	21	18	38	67
Lynnhaven	1456	368	71	55	27	37	15	42	72

Legend

Enroll	The total school membership during the 1994-95 school year.
FRL	The number of students in the free and reduced lunch program in 1994-1995.
Att	The percentage of students who missed ten or fewer days of school in the 1994-1995 school year.
Fl	The percentage of 8th grade students who took a foreign language prior to the 9th grade.
Flms	The percentage of minority 8th grade students who took a foreign language prior to the 9th grade.
Alg	The percentage of 8th grade students who took Algebra I, or Algebra I, part I, prior to the 9th grade.
Flalg	The percentage of minority 8th grade students who took Algebra I, or Algebra I, part I, prior to the 9th grade.
75 per	The percentage of 8th grade students who took the Virginia State Assessment Program standardized tests under standard conditions whose composite scores were above the national 75th percentile.
50 per	The percentage of 8th grade students who took the Virginia State Assessment Program standardized tests under standard conditions whose composite scores were above the national 50th percentile.

Vita

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Educational Background:

Doctor of Education

Educational Administration, Virginia Polytechnic and State University,

February, 1997. The dissertation compared indicators of school

success between middle schools of different sizes in Virginia.

Certificate of Advanced Graduate Study

Educational Administration, Virginia Polytechnic and State University,

August, 1996.

Master of Arts

History, Virginia State University, Petersburg, VA, May, 1977

Bachelor of Science.

History, University of the District of Columbia, Washington, D.C.,

December, 1994.

Employment History:

1992-Present.   Director of Middle Schools, York County School Division,
York County, VA.

1989-1992.	Principal, Peabody Middle School, Petersburg, Va.
1986-1989.	Assistant Principal, Hopewell High School, Hopewell, VA.
1977-1986.	Social Studies Teacher, Hopewell High School, Hopewell, VA.
1975-1980.	Adjunct Instructor, Social Studies, J. Sargent Reynolds Community College, Richmond, VA.

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