

THE RELATIONSHIP BETWEEN BUDGET EXPENDITURES AND BUILDING
CONDITIONS OF SELECTED SCHOOL DIVISIONS IN THE COMMONWEALTH OF
VIRGINIA

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Abstract

The purpose of this study was to examine the relationship between selected budgetary expenditures for facilities and debt service and building conditions in the Commonwealth of Virginia. One research question and three sub-questions for selected school divisions were used to investigate this topic. The major data components used in this study were provided by the Virginia Department of Education. Twenty -two school divisions in the Commonwealth of Virginia were selected for the study, based on a previous study conducted by Crook (2006). Crook identified and classified selected school divisions as standard or substandard pursuant to the responses of principals who responded to the Commonwealth Assessment of Physical Environment (CAPE) assessment instrument. The line items of “facilities and debt service” were analyzed over a five year period for fiscal years 2000-2005.

An independent t-test drawn from SPSS software was used to determine statistical significance between combined per-pupil expenditures for facilities and debt service. A comparison of the (1) means of total expenditures in the facilities and debt service line items, (2) total per-pupil expenditures, and (3) annual per-pupil expenditures was used to determine statistical significance. Analysis of the VEA measure of fiscal capacity and effort was conducted to ascertain the similarity of the two groups of school divisions.

The findings of the study indicate that an analysis of total expenditure and per-pupil spending during the fiscal years of 2000-2005 reveal strong statistical significance in spending between school divisions with buildings classified as satisfactory and unsatisfactory in the line items of facilities and debt service. Analysis of five year total expenditure mean revealed there was strong statistical significance found in the two financial line items. Analysis of yearly per-pupil expenditures revealed that there was no statistical significance in the budget line item of facilities. Statistical significance was found in the financial line item of debt service during the academic year of 2000-2001 with a p value of (.025).

DEDICATION

I would like to dedicate this paper to my loving wife Robin. Without her support and constant encouragement, this dream would not be a reality. You have always been my biggest fan. When I was down, you picked me up; when I was unsure, you comforted me. I want you to know that I love you. I also would like to dedicate this work to my children, Garrett and Kamryn; I want to thank you for your understanding and support throughout this process. It is my hope that this work will serve as a sense of inspiration to you. To my parents Mr. and Mrs. Thomas W. Whitley, I thank you for your continued support and words of encouragement. I would like to thank my sister Jacqueline Elliott; thank you for always believing in your big brother. I would like to thank my friend Raymond A. Wilkerson Jr., for all of your words of encouragement throughout this journey.

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CHAPTER 1

INTRODUCTION

Recent studies noted by Filardo, M. W. Stein, T., Sung, B., & Vincent, J. M. (2006) and the United States General Accounting Office have found the physical state of schools in the United States to be one of concern. Approximately 40% of school buildings in the country are in need of repair. In many school systems, particularly in urban and high-poverty areas, students attend school in buildings that threaten their health, safety, and learning opportunities (U.S. Department of Education, National Center for Education Statistics, June 2000).

The General Accounting Office found that 25 million children attended school in buildings with at least one unsatisfactory condition. One-third of all public school buildings in the country, about 25,000, serving nearly 14 million children were in a serious state of disrepair. The most decrepit schools served primarily minority and low-income students (United States General Accounting Office, 1995).

There are several reasons so many school buildings are in such poor condition. The major contributing factors are; (a) the lack of leadership in the local school division, (b) the inadequate financial ability of the school division, (c) the age of buildings, and (d) the quality of the material used to construct the buildings. These reasons are augmented by the political climate of the local school divisions where opposing viewpoints on capital funding oftentimes prevail over anything else in determining the condition of school buildings.

The United States prides itself on being a nation in which all are created equal. However, building conditions in its public schools are sometimes ignored by leaders such as city council members, state and government officials, school board members, and superintendents. Nevertheless, funding of schools continues to be one of the main challenges for superintendents and school boards. When the question of capital improvement presents itself, financial ability begins to take on a new meaning.

The improvement of the physical condition of public schools in the United States continued to receive some attention in the arena of public policy. Across the country, public school district spending on school construction, on new schools, and on upgrading existing schools has grown steadily over the last decade. Of the 15,239 school districts in the United States, nearly three-quarters had school construction projects during the years of 1995 to 2004. Not since the post World War II Baby Boom, has the nation seen such investment in public K-12 school buildings (Filardo, Stein, Sung, Vincent 2006).

Research supports the fact that money is being used to address building conditions across the country. If this is true, why are there such a large number of schools that are in need of renovation or replacement? This is an area that is not understood by educators, or members of the general public; therefore, exploring the relationship between financial ability and building condition serves as the focus of this study. This research will provide possible information that would merit additional study of the relationship of financial ability and building conditions.

Statement of the Problem

This study will investigate the possible relationship between the financial expenditures of the local school divisions, the state report fiscal capacity and fiscal effort of local school divisions, and building conditions in select school divisions in the Commonwealth of Virginia.

Research Question

Is there a relationship between the financial expenditures of school divisions and school building conditions in the Commonwealth of Virginia?

Research Sub-Questions

1. Is there a relationship between expenditures for the facilities section of the local budget and building conditions in school divisions with buildings assessed as being in satisfactory and unsatisfactory condition?
2. Is there a relationship between expenditures of debt service and building condition in school divisions with buildings assessed as being in satisfactory and unsatisfactory condition?
3. Is there a difference in the Virginia reported fiscal capacity of local school divisions, as measured by the Local Composite Index, and fiscal effort between school divisions that have school buildings assessed as being in unsatisfactory or satisfactory condition?

Significance of the Study

Recent studies such as Cash (1993) and Hines (1996) have found a positive relationship between building conditions and academic achievement and behaviors. These factors were illustrated in the theoretical model designed by Cash (1993). However, there has not been any research that has explored the possible relationship between financial ability and building conditions.

The significance of this study will be the investigation of possible relationships between financial expenditures, fiscal capacity and fiscal effort, and building conditions among select school divisions in the Commonwealth of Virginia. The study will attempt to provide evidence that will offer a more concise explanation of the conceptual model of Cash (1993) as it relates to financial ability and building conditions.

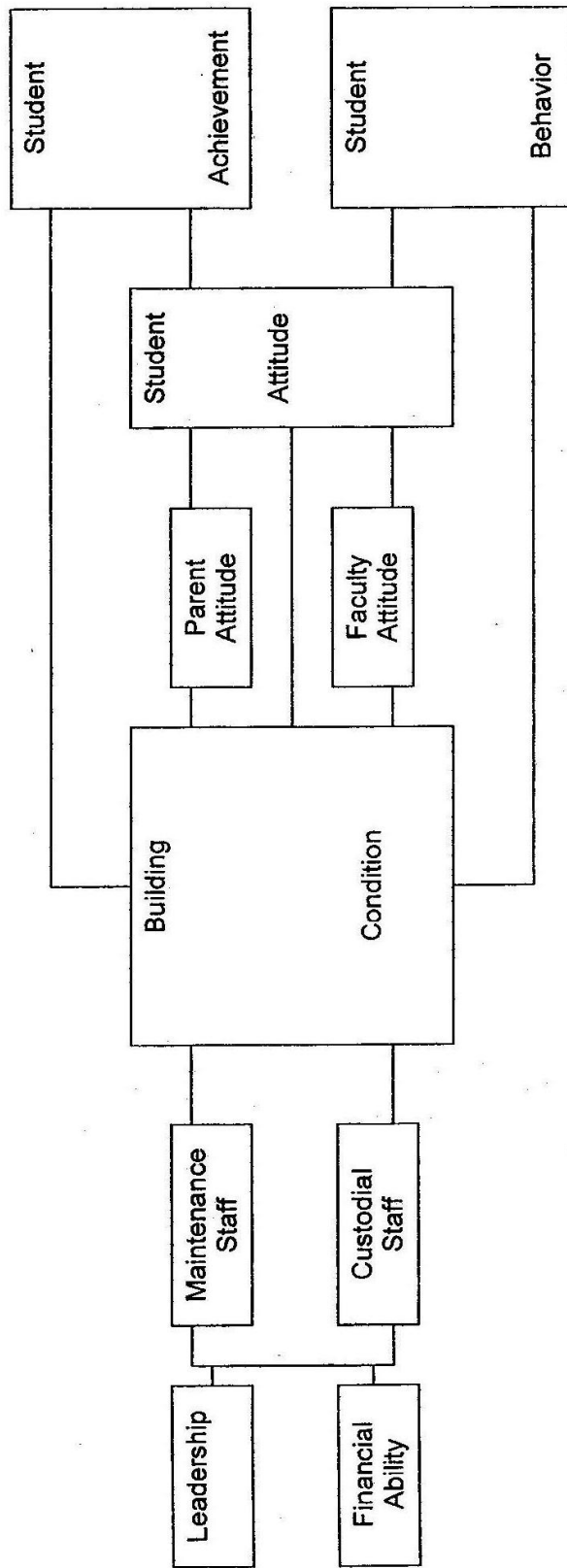
The results of this study may serve as a reminder to school superintendents, principals, and school board members that the amount of funds spent on the facilities and debt services sections of the local budget represent an indication of the effort that is made by local school authorities in maintaining safe and modern school buildings. This study could be important to educators by providing possible evidence that may be beneficial for additional research in the area of financial ability and building conditions. If the results of this study indicate there is an identifiable positive relationship between the variables of financial ability, as defined, and the condition of school buildings, perhaps further research will indeed be profitable.

Theoretical Basis of Study

This study was designed to explore the possible relationship between financial ability and building conditions. Cash (1993) developed a theoretical model that has been used to explain the relationship between building conditions and academic achievement and behavior (See Figure 1). Other research studies such as Hines (1996) and Crook (2006) used the Cash (1993) model.

In the theoretical model two factors served as points of reference in understanding the relationship of leadership and financial ability on building conditions. The term leadership refers to principals, superintendents, school board members, and city and county officials. These individuals make decisions that determine the direction of how they want their buildings to be viewed in the eye of the public in which they serve. The view or direction of leadership determined what emphasis is placed on the maintenance and operations portion of buildings.

The leadership vision pertaining to buildings determined the type and number of maintenance staff required to maintain the buildings as it relates to the expectations of the superintendent, school board, and principals.



Model Design (Cash, 1993, p.4)

Figure 1

The size of the maintenance staff is based on several factors. One factor is the number and size of buildings in the division and the conditions of the buildings. The other factor is the financial ability of the school division to fund the cost of maintaining facilities by providing the resources that contribute to the upkeep of buildings such as: equipment services, building services, and security services.

For the purpose of this study, financial ability pertains to the amount of funds school divisions spend to maintain and renovate existing buildings, and the amount of money that school divisions could possibly spend on building new facilities. These areas, as it pertains to financial ability and building conditions, are determined by the leadership of the school division. The local budget reflects line items in maintenance and operation to address the area of maintaining school facilities.

The theoretical model suggested that the financial ability of the school division helps determine the amount of money expended on personnel that maintain school facilities. These individuals are responsible for maintaining the daily operation and required maintenance of the school. Custodians are important factors in maintaining buildings and contributing to the overall condition of schools. The custodial staff is responsible for maintaining building conditions regardless of age of buildings or other factors that they may encounter. Their commitment to maintaining schools is reflected in the condition of the building.

The possible relationship of parental attitudes about the condition of the school building could influence the attitudes of students. Parents are taxpayers who normally view public schools and the conditions of these facilities as an investment of their local

tax dollars. The condition of buildings themselves could have a positive or negative influence on the attitudes of parents, students, and teachers as well as their connection to schools.

Bowers and Burkett (1988) investigated the differences in achievement, health, attendance, and behavior of two groups of students in different physical environments: two elementary school buildings with students between the ages of 5 and 13 in the same school jurisdiction in rural Tennessee were used to differentiate physical environments for this comparison. One school was a recent, modern building in all respects. The other was constructed in 1939 and had very little improvement to the physical structure. The researcher reasoned that the students, faculty, and educational programs in both buildings were essentially the same. Students in the fourth and sixth grades were tested to determine the degree of academic achievement. Students in the new school building significantly out-performed students in the older building in reading, listening, language, and arithmetic. Further, faculty in the new building reported fewer disciplinary incidents and health conditions than faculty in the old building.

The attitude a student has about the building is one factor that is very important in developing an understanding of the relationship between building conditions and student attitudes. Students have a tendency to take care of buildings that are well maintained. Building conditions could have a positive effect on student behavior and attitudes towards their school. When students attend schools that are well maintained, they have a tendency to develop a sense of pride and connection to the school, and therefore exhibit positive behaviors that contribute to the total educational environment.

Even more so, the physical conditions of the building play an important part in the wellbeing of the student who is trying to learn in either good or poor building conditions.

Dawson and Parker (1998) provide a descriptive analysis of the feelings of teachers about the building, during, and after a renovation project is done on their schools. Building conditions have a direct correlation to the attitudes of faculty and staff. Buildings that are well maintained contribute to the overall climate of the school. Faculty members expect to work in facilities that are cared for and maintained. They generally equate building conditions to the level of expectations that are designed to develop environments that are conducive to learning. Classroom space and modern equipment contribute to the attitude of the faculty and staff. When necessary equipment is in place and in good repair, the attitude of the faculty is generally positive. When there is adequate space in the facility to address the need of the student population, there are usually positive attitudes from the faculty and staff.

The theoretical model suggested that student attitudes about the building are influenced by the faculty's attitude of the building. If students observe that there are high levels of expectations from the faculty about the building, they will generally mirror that attitude. Students and teachers want to attend schools and facilities that are well maintained. The attitude that students develop early about building conditions could prove to be powerful. If this attitude is positive, this will generally lead to positive factors such increased attendance and high academic achievement. However, if the attitudes about building conditions are negative, it could lead to low attendance, high drop-out rates, and low academic achievement.

The theoretical model suggested that there is a possible relationship between student behavior and building conditions. If students are committed to their school environment and building conditions are positive, they generally will have a sense of pride and positive connection to their school. This connection could possibly result in positive student behavior.

Definitions

For the purpose of this study the following definitions are provided:

Financial Ability – is the capacity of the locality to generate funds to support capital projects for public schools. In this study financial ability are the funds expended in the two categories of facilities, and debt service in the local operating budget.

Debt Service – is a section of the local operating budget used to make payments on money already spent for capital projects. Capital outlay, principal, interest and service charges account for expenditures addressed in the line item.

(As noted debt service includes repayment of principal which is difficult to extract from the aggregate. Consequently there is some double counting for the cost of facilities which should be taken into consideration. Only the debt service/capital funds appropriated to and paid directly by the school division were reported (Annual School Report Financial Section 2008-2009).

Facilities – is the section of the local school division operational budget represents activities concerned with acquiring land and buildings, remodeling buildings, constructing buildings and additions to building, installing or extending service systems and other built-in equipment, and improving sites (Annual School Report Financial Section 2008-2009).

Per- Pupil Expenditures – are expenditures of the local budget based upon a cost per-pupil. Local expenditures are normally divided by the Average Daily Membership. In this study, per-pupil expenditures are the total expenditures of funds

in the facilities, and debt service section of the local operations budget divided by the membership figures of March 31.

Local Composite Index – is the measurement of “local ability to pay”; it is a measure of the local ability to pay as calculated by a state-wide comparative, weighted formula including a locality’s Local True Value, State True Value, Local Adjusted Gross Income, State Adjusted Gross Income, Local Taxable Retail Sales, and State Taxable Retail Sales (VDOE) .

Average Daily Membership (ADM) – is the total number of school days within a given term-usually a school month or school year that a student’s name is on the current roll of a class, regardless of his/her being present or absent, is the “number of days in membership” for that student. The sum of the “number of days in membership” for all students divided by the number of days in the term yields ADM (Department of Public Instruction, 2008).

Virginia Education Association Fiscal Capacity – measures the ability of a locality derived from the Local Composite Index to fund educational services (Virginia Education Association Research Services 2009).

Virginia Education Association Fiscal Effort – is a measure of the local expenditures for current operation of schools. Fiscal effort relates the wealth of a community to its current educational expenditures (Virginia Education Association Research Services 2009).

Limitations of Study

1. This study is exploratory and the results cannot be generalized beyond the population of the study. The small number of school divisions included in the study prevents generalization of data.
2. The financial ability as defined in this study may not completely represent the total ability of school divisions to provide adequate safe and modern school facilities.
3. The school divisions selected were identified in a study by Crook (2006) and do not represent the entire population of school divisions in the Commonwealth.
4. The leadership of the school division has certain expectations about how well the school buildings should be maintained and how they should look. This variable influences the eventual condition of buildings. Because there is no control for the variable in the study, results may not represent the exact nature of the relationship.
5. The current study is a pilot project to ascertain if a significant relationship existed between selected budget items and school building condition. Within the selected budget items, there are expenditures that are made for services and equipment not directly related to the condition of a school building. Because of this, caution must be observed in interpreting the findings of this study.

6. The maintenance and operations section of the local budget has funds for the upkeep of existing buildings. Within that budget section, however, are expenditures not directly related to the upkeep of buildings? For that reason, the maintenance and operations expenditures are not included in the analyses.

7. Divisions were selected based on results of the CAPE assessment instrument used in research conducted by Crook (2006).

CHAPTER 2

REVIEW OF LITERATURE

This study explored the possible relationship between selected school division financial expenditures and the condition of school buildings. In developing the idea of a relationship between these two factors, a review of literature and research is presented that discusses some initial thinking about production function research in the public schools in general and then specifically about those studies that deal with expenditures and the physical condition of school buildings.

In the last half century, there have been studies that have linked the expenditure of funds by the public schools to the academic performance of students. These studies have not necessarily been successful in establishing a causal relationship. Nevertheless, studies have shown that there are indicators that student performance has increased as the amount of money spent for selected instructional strategies or organizational changes has increased.

Analysis of Research

Elliott (1998) conducted a study entitled *School Finance and Opportunities to Learn*, this study linked U.S census data on school finance to data from the National Education Longitudinal Survey of 1988 to evaluate the process through which financial resources affect opportunities to learn in U.S. public high schools. The study focused on three specific questions as it relates to opportunities to learn or (OTL); Does educational expenditures affect students' achievement? What components of opportunities to learn affect students? If funds are allocated for the most critical components of OTL, do

students learn more? The review of literature for this study addressed two highly debated prospectives; one which makes a case that money does matter when attempting to improve schools, and the other which indicates that there is no significant relationship between increasing expenditures and improving students' achievement.

Elliott (1998) noted the ongoing debate between Hanushek and Greenwald, Hedges, and Laine which centered on methodological considerations. Hanushek (1989:47) concluded that there is no strong or systematic relationship between school expenditures and student performance. Greenwald et al. (1994) argued that Hanushek misinterpreted the thrust of his results and that his method was biased toward accepting the null hypothesis of no relationship between expenditures and achievement.

The sample size in the Elliott study consisted of 14,868 public school students in the 10th grade in the areas of science and mathematics who were interviewed in 1988 and 1990. Hierarchical linear modeling (HLM) was used to estimate school-level intercepts of students' achievement. Math and science achievement was estimated with a series of equations in which sets of variables were added in the following sequence: (1) eighth-grade achievement and student-level controls, (2) expenditures and school-level controls, (3) teachers' qualifications and class size, and (4) teaching emphases and classroom resources. HLM was used to control for the clustering of students with shared characteristics into the same schools (Bryk & Raudenbush, 1992).

The findings of this study indicated several ways in which resources are being used effectively in U.S. public high schools. Both the math and science analyses confirm that money matters and that teaching practices and classroom resources

matter, but it is only in the science analyses that the mediating effect between finance and achievement of teaching practices and classroom resources is demonstrated. This study provides firm support for the position that money does, in fact, affect students' achievement.

Alexander and Salmon (1995) also questioned the suitability of Hanushek's input-output model when analyzing educational outcomes. This model, usually used in the business sector, equates the value of the output of a process relative to the value of the inputs used for production. In an educational setting, Hanushek theorized that increasing expenditures for teacher salaries and instructional materials should produce a corresponding increase in student achievement. However, applying this model to a non-industrial activity such as learning was not appropriate because of the lack of exacting definitions for the variables being studied. Often, educational performance is the result of the cumulative effect of a variety of experiences that cannot be captured in this type of equation. At best, each school situation would require a separate production function equation that fits its particular community and student body (Alexander & Salmon, 1995).

The impact that spending has on educational achievement is debated heavily among scholars throughout the world. Some think that spending alone is the key to success in public education; others feel that how you spend and identify need and purpose for proposed spending is important. Wenglinsky (1997) provided valuable insight into this debate as it relates to spending practices in public education. School finance policy proved to be the issue of great debate in the most effective measure of school spending. Policymakers continue to be divided in their views and philosophy of

school spending practices. As a result, laws and legislation related to school finance reflect the inconsistency of the present time. The lack of a clear causal relationship between educational inputs and expected outcomes is a result of inconsistency in data analysis, the lack of a standard measure for student achievement, the failure to account for differential spending among geographical regions, and the lack of a specific definition of what per-pupil expenditures entailed.

Wenglinsky (1997) collected data for this study from three sources, (1) the National Assessment of Educational Progress (NAEP), a national representative sample of fourth and eighth graders who took achievement examinations in mathematics and were asked questions pertaining to their background characteristics and the climate of the school; (2) the Common Core of Data, a database of school finance information collected by the U.S. Department of Education from all school districts in the nation; and (3) the Teacher's Cost Index, also developed by the U.S. Department of Education, which measures variations in the cost of education between states (Wenglinsky, p. 1).

Wenglinsky found evidence that resources spent with the hope of improving achievement, did have a positive effect on fourth and eighth grade achievement which were the subgroups within that study. Money spent on other factors that could possibly lead to increases in overall achievement such as reducing student-teacher ratios and addressing pressing capital needs such as building or renovating facilities, contribute to the objective of raising student achievement. Components such as social-economic status and the level of parental involvement also played major roles on the level of achievement for fourth and eighth grade students. Money spent to provide sound educational programs to address the cognitive development of young students, such as

pre-K or headstart, provides school divisions a genuine opportunity to move forward with promoting high academic achievement for all.

The City of Newark, New Jersey proved to be the focal point of the Wenglinsky study because it was a school division that had many challenges. Mainly, Newark was noted for being poorly managed and providing marginal resources for its school aged children. Per-pupil expenditures were grossly below state average and the tax base was not strong. Poverty and lack of commitment from city legislators in this community resulted in poor school facilities and basic neglect of the school division. Sustained lack of performance within the division paved the way for a state takeover of the district. Many changes were made after the takeover. A new superintendent was appointed to lead the school in a different direction. An analysis of funding and spending practices was conducted and it was determined the biggest hurdle to success was the way in which resources were spent. A mandate to cut wasteful spending was enacted; as a result, more money was spent on improving academic achievement. The reorganization of priorities and spending practices led to change within Newark Public Schools. Massive layoffs and reclassification of jobs led to positive change within the district. Wenglinsky noted that spending to improve or replace old and dangerous facilities proved to have a positive impact on achievement among school aged children. When children note that school authorities are spending money to improve the physical structure of schools, they make the determination authorities care and this translates into improvement in academic achievement. When teachers notice that school district authorities are committing more money to teacher salaries and incentive programs, they generally are attracted to work in such districts.

The flow of dollars and its influence on achievement for fourth and eighth grade students in Wenglinsky's study appeared to avoid reducing student teacher ratios; it also influenced achievement positively in mathematics and thus provided an encouraging school environment.

Cohen, Chew, and Millman (1975) suggested that educational inputs and outputs have been notably difficult to specify-- not to mention the problems of quantifying them once some degree of consensus has been reached about their mere identification. The notion of additional resources equating to greater output is a conception that is challenged and also supported in capital funding research. School divisions that have resources to make consistent contributions to the educational process are expected to make the greater contribution to our society by producing products that are ready to contribute in maintaining and elevating our society immediately. The same expectation proved to be a reality to the school divisions that are not as wealthy and do not have the means to consistently enhance the educational system by the resources that are afforded to them. Cohen, Chew, and Millman (1975) pointed out that when input-output techniques are used as management tools in education the students are viewed as the unit of analysis, with individual characteristics and socio-cultural factors as inputs into the process through which competencies are developed (p. 13).

The assumption that more is better is a theory that has not been proven when we speak of educational achievement and capital funding. The notion that students in school divisions with better facilities and abundant resources perform better and produce better prepared graduates than students in poor school divisions is one of

debate. The research to support this theory did not show a strong correlation between the level of money spent and academic achievement. Spending alone does not determine performance in schools, other factors outside of the school could have an impact on student performance.

On the other hand, Hedges, and Greenwald (1996) concluded that there is quite a strong relationship between economic resources and educational results. They concluded that global resource variables, such as per-pupil expenditures, are important, as are also more specific categories of resources, such as smaller schools and smaller classes. They also concluded that variables that attempt to describe the quality of teachers, such as teacher ability, teacher education and teacher experience show very strong relationships with student achievement.

Some input and output studies focused on the relationship between expenditures for maintenance and operations and student achievement. This relationship has proven to be fascinating in the search of statistically significant evidence that could support the theory of increasing resources in capital funding efforts to consistently produce greater results in student achievement. Capital investment alone is not the answer to a higher performing student population.

Building conditions within Virginia schools can have an impact on student performance; however, there are other factors that must be considered when the focus is on input within schools and divisions. Teacher motivation and morale, student enrollment, professional development, and recruitment and retention of highly qualified

teachers are all factors that must be considered when evaluating the impact of financial expenditures and building conditions.

The question of whether there is a correlation between the funding of capital projects and academic achievement remains to be one of great debate. A study conducted by the Department of Education and Employment (2001) between September 1999 and March 2000 in the United Kingdom examined the possible connection of capital investment in schools and academic achievement. The methodology of this study was both quantitative and qualitative. The purpose of the study was to examine the degree to which capital spending influenced academic achievement in schools in England. The study consisted of three main strands of work; the literature review, qualitative analysis, and quantitative analysis. The literature review covered 54 studies, many of which were conducted in the United States. The qualitative analysis consisted of gathering interview data from headmasters and officials of five local education authorities. Quantitative analysis resulted in an analysis of financial and student achievement data from 1,916 primary and secondary schools throughout England.

The first part of the research project reviewed existing research studies dealing with the relationship between capital expenditures and student performance. The studies reviewed for the Pricewaterhouse research were based on three very distinct areas: economic studies of resource and student attainment, school effectiveness and improvement, and building conditions, and design. Economic studies of resource allocation and student attainment were reviewed from both a quantitative and qualitative perspective. The development of a conceptual model that focused on a four prong

approach which included teaching staff, support staff, finance and administration, and school policy identified three factors which affect pupil attainment. The conclusion of the literature within this study that focused on the relationship between capital expenditure and student performance provided a mixed review of findings. There is some evidence that supported the idea that there is a positive relationship, some evidence of a negative relationship, and other evidence that supported the fact that there is no relationship at all between capital expenditure and student performance (Department of Education and Employment p. 13).

The conceptual model identified three factors that affect pupil attainment, namely (a) the quality of pupil learning, (b) the amount of pupil learning and (c) prior pupil attainment. The model was used as a framework for discussions with head teachers regarding the main factors which influence pupil attainment. A number of findings emerged from the discussions with headmasters. Headmasters indicated during interviews that pupils who attend school on a regular basis have a greater impact on pupil attainment than the amount of learning (Department of Education and Employment p. 21).

Headmasters also identified the quality of teaching as being the most significant single factor affecting the quality of learning. Headmasters identified a link between teacher quality and pupil motivation. A teacher who is prepared and engaging in the classroom generally develops a rapport with students that leads to higher expectations and increases in pupil attainment and quality of learning within the classroom.

The second part of the research project discussed the interview data obtained from the local school authorities. Capital investments played a major role in teacher motivation and morale according to the findings within the study. Teachers felt appreciated when efforts to relieve overcrowded classrooms were made within the local educational authority, or when facilities with the greatest need were renovated or replaced. It was determined through interviews with the headmasters that investments in capital projects produced results that not only addressed maintenance and operation issues, the investments also addressed instructional issues by providing new or renovated facilities in which students and staff could enjoy. According to some of the findings in this study, parental support increased as a result of investment related to capital projects. Parents developed a new sense of ownership as it related to the schools and the division capital efforts. Parents were asked questions that focused on factors that were influencing pupil attainment such as: What factors do you believe have most influenced the educational achievement of pupils at your school? What capital expenditures have taken place in your school in recent years?

Headmasters were asked questions that focused on factors influenced by capital spending. They were asked to participate in surveys that rated their schools on a scale of 1-5 with one representing very low and five representing a high level of influence. This survey focused on an array of factors such as finance, leadership, teacher motivation, and pupil attendance.

The research found that capital investment was judged to have a strong influence on three main factors, each of which had a major impact on pupil performance. The three areas were teacher motivation, pupil motivation, and amount of learning. Capital

investment was found to be one of the two most important levers on teacher motivation. For example, the boost of morale which teachers received from working in an appropriate and quality physical environment is measurable in terms of reducing the turnover rate of teachers within local educational authorities. In addition, the replacement of old and dilapidated equipment led to the introduction of new and innovative instructional strategies in the classroom. Pupil motivation was explained through the visible sign that their education is valued by the teaching staff and society in general. The amount of learning was indicated by reducing the amount of time teachers and students lost moving between different school buildings and classrooms (p. 31).

The third part of the research project dealt with the analysis of data from the local school authorities. The quantitative analysis portion of this study indicated that positive relationships between capital spending and performance existed. It also showed that these relationships were not always significant from a statistical point of view, and that some studies have found negative relationships to exist.

Pricewaterhouse conducted an analysis of two types of schools, capex and control schools. Capex referred to those schools in the sample in which there was some capital expenditure between 1993 and 1995, and “control” refers to those schools in which there had been none. The impact of capital expenditures on performance was measured by using two models. Model 1 illustrated the situation in which the effects of capital investment on pupil performance are examined after having controlled for a range of background variables (e.g. school type, region etc). Model 2 is the same as Model 1 except that in addition to the full range of background variables, it also controlled the effects of a range of Office of Standards in Education (OfSTED) variables

such as teacher quality, adequacy of general resources, leadership, attitudes; behavior; and relationships (p. 34).

Similarly, the quantitative analysis conducted in the Pricewaterhouse study provided additional evidence of a positive and statistically significant relationship between capital investment and pupil performance. However, in common with the findings of other studies, the estimated relationship is relatively weak. Furthermore, the relationship was not positive in all cases, nor was it always statistically significant (p. 43). Examples of these relationships could be found in the review of analysis of student data from primary and secondary schools. Primary schools were grouped in Key Stage 1 & 2 which focused on performance in mathematics, reading, and writing. Key Stage 1 consisted of the percentage of eligible students achieving Key Stage level 2 or higher in the areas of math, reading and writing. Key Stage 2 consisted of the percentage of eligible students achieving Key Stage 2 level 4 or higher in math, english and science. Most of the quantitative analysis was based on changes in performance between 1995 and 1999 (p. 33).

In laymen's terms, the performance of primary and secondary schools were examined and various measures of performance were used. By using a range of performance indicators and controlled grouping the study provided an unbiased assessment of the relationship between capital investment and student performance.

Pricewaterhouse findings state that schools in which there have been large amounts of capital spending generally improve their performance more than those schools in which there was no capital spending. For example, secondary schools in

which there was no capital spending improved their A level performance (as measured by A level points scores) by 17%; this compared to an average increase of 26% in those schools which spent relatively large amounts on capital improvements. Similarly, primary schools in which there was no capital spending improved their Key Stage 1 performance (as measured in terms of Level 2 achievement in Math, Reading and Writing) by around 7 %; this compared to an average increase of around 12% in those schools which spent a relatively large amount on capital (p. 39).

Statistical significance of the relationship of capital investment and student performance indicates significance in Key Stage 1 and 3 for all schools. Multivariate analysis suggests that capital spending has a positive and statistically significant impact on performance changes at Key Stage 1 and Key Stage 3. An increase of the equivalent of 100 Pounds in average spending per head in primary schools would result in a corresponding increase in performance of around 0.04 percentage points, from 8% to 8.04%; this represents a proportionate increase of 0.5%. For Key Stage 3, a corresponding capital injection would improve performance by around 0.4 percentage points, from 13% to 13.4%; this represents a proportionate increase of 3% (p. 42).

Department of Education and Employment (2001) concluded that there are notable changes in the performance of students in schools that have had some evidence of increases in capital spending. Teacher motivation increased as a result of capital spending. By reducing class size, the educational environment improved which in turn contributed to increases in teacher motivation. Spending to improve the educational environment in public schools sends a message to the parents in a community that their children matter.

Parental support increased as a result of capital spending in this study because parents could see physical evidence of improvement to schools that had legitimate needs. It was noticeable that head teachers of primary schools and some Foundation Schools considered that capital expenditure had a greater impact upon parental support, compared to head teachers in secondary schools. This might be related to primary schools having more frequent, daily in most cases, contact with parents. In addition, in the recent history of Foundation Schools, more emphasis has been placed on parental relationships compared to other secondary schools. In most instances, the parental support was said to be influenced by their recognition of the quality of the new buildings and their enhanced wish for their children to experience such improved facilities. In a small number of cases the school had used the building work to create specific additional resources for parental use (p. 29).

Parents often hear politicians and school leaders speak of changes that they want to make to the physical structure of schools. However, when parents witness evidence that support their vision, then they become believers in the process and recommit to schools and school divisions.

Capital spending also helped with recruiting and retention of highly qualified teachers. Teachers generally want to work in areas that provide positive working environments. Investing in improving the physical environment of schools generally sends a message of educational commitment that promotes academic excellence within the classroom. Teachers know that they are working in a local educational authority that has demonstrated its willingness to provide an atmosphere that fosters academic excellence. The impact of capital investment was validated from letters and transcripts

of interviews from stakeholders in and around the communities that participated within the study.

The study further revealed the importance of relationships on the findings associated with capital spending and academic performance. The nature of the relationship indicated that outcomes within the study could vary. The issue of capital spending and improved academic achievement could present data that suggest negative and positive correlations. The strength of the relationship is small according to Pricewaterhouse, and the majority of the data were not statistically significant. This study illustrated that it is difficult to say that capital spending improved academic performance. There is some evidence, however, weak at best, that supported the fact that if school divisions invest more in capital spending academic performance will improve. Improvements in pupil performance on all levels seemed to be relatively unresponsive to capital investment (p. 47). The evidence suggested that the effect of capital investment varies according to factors such as socio-economic factors, prior pupil attainment and school and class size. Such variables would provide varied results when analyzing the influence of capital investment on academic performance. Race and gender are additional factors that could be considered when examining the relationship of capital spending and academic performance.

Capital funding is a topic of great political debate. The level of spending in public schools varies among school divisions in the Commonwealth of Virginia. There are some school divisions that have more resources than others and can support to a greater degree different aspects of public education. There are other school divisions that have legitimate needs that are not met because of the lack of funding, or the

inability of localities to generate funds. The school divisions with the greatest need and inadequate funding are faced with limited options. These school divisions do not have the resources to attract the best teachers, they do not have the state of the art equipment, and they often find that building conditions are poor at best. These factors tend to have a negative impact on achievement.

In a report prepared by Standard and Poor (2005) each school division in Virginia spent an average of \$969 per student in 2001-02 on capital projects. One could be encouraged by these numbers, however, it is important to note that the increase in the number of school aged children attending public schools that are in need of renovation or replacement far exceeds the rate of investment on capital projects in the state. Spending on capital projects increased by an average of 4.7% per year since the 1999-2000 school year. Of the capital spending, 47.6% was for construction, while 23.2% was for purchasing or improving land and buildings; 20.3% was used for equipment and 8.3% was used for instructional equipment (p. 20). The data suggested that the state appeared to be moving in a positive direction at that time. However, it is important to note that the Capital spending would present a different picture today as demographics, construction, and building conditions have naturally changed over the years.

Standard and Poor (2005) reported in 2001-2002, approximately 67.9 cents of every dollar on day to day operations of the school division went directly to instruction and instructional support services. In the belief that “new” investments in education are more likely to be effective in raising achievement if they are allocated to the classroom, Standard and Poor’s has created a new metric that tracks the share of new spending that is allocated towards instruction, by examining the allocation of spending over

increases over time. This indicator, known as the Instructional Spending Allocation Index, reveals that approximately 63.1 cents of every dollar of new money spent on core operating activities between 1999-00 and 2001-02 went directly to instruction.

Spending for Capital improvements proved to be a very small portion of Virginia's operational budget. Standard and Poor (2005) reported that only 9.7% of the total operational budget was used for operations and maintenance. In the years 1999-2000 through 2001-2002 only 8.8% was allocated for operations and maintenance. This suggested that most of the money come from local sources in the Commonwealth. Maintenance and operation funds were used to maintain and operate already existing facilities. These funds were used to provide support for personnel that are employed for the upkeep and routine operation of the facilities within a school division.

To accurately evaluate the return on capital investment in the state of Virginia the Standard and Poor report focused on the Return on Spending Index and the Performance Cost Index for four specific areas: student performance; spending; revenue and taxes; school environment; and community demographics. The Return on Spending Index represented the average number of percentage points that a school division achieved on all state assessment tests such as the Standards of Learning (SOL) for every thousand dollars spent.

Performance Cost Index measured the average amount of money spent by a school division for each percentage point of the rate on the state assessment test. The evaluation of return on capital investment is important because there are some who share the belief that money spent to support capital investment initiatives is not money

well spent. Achievements in the eye of stakeholders who share this philosophy need evidence that would indicate a return on the investment. Such returns are measurable monitoring the level of performance by every school division within the state.

Stakeholders such as business and corporate leaders and local taxpayers depend on school divisions to develop a workforce that is competent and ready to contribute immediately; this is how they determine whether the investment of tax dollars justifies the need that is articulated by local and state educational leaders such as superintendents and school boards.

The RoSI or Return of Spending Index can be thought of, in certain circumstances, as a measure of educational productivity expressed as the average level of student proficiency achieved for a given level of spending. Specifically, it represented the average number of points of the RaMP or Return of Math Performance indicator associated with each \$1,000 of core spending per student. For the state as a whole, assuming all else to be equal from one year to the next, the return on spending can be viewed as improving if the RoSI value increases over time. The return on resources of a state included all student learning and achievement produced with available resources as measured by results of the Standards of Learning Test.

All school systems need significant financial, human, and material resources to effectively educate students. Measuring the return on the public's investment in education requires analysis of aggregated and disaggregated student achievement, expenditure patterns, revenue and financing data, the school environment, and community demographics (p. 22).

Establishing correlations between input (school resources) and output (student performance) proves to be challenging in the sense of providing significant evidence that more is better in addressing the issue of educational attainment. Does providing better buildings and state of the art equipment prove to be the common denominator that leads to greater results when it comes to public education? This is a question that is challenged by researchers such as Hanushek. Hanushek argued that the preponderance of evidence indicates no relationships between school resources and student achievement exists.

Summary

Facilities research over the years has reported mixed findings when exploring the question of whether there is a relationship between funding, building conditions, and achievement. Greenwald, Hedges, and Laine (1996) noted that there is a significant relationship between money and achievement. These researchers believe that additional resources will assist in the creation of smaller class size and schools. They also believed that the additional resources will assist school divisions in hiring and retaining more qualified teachers. All of these spending methods are designed to ultimately improve achievement in schools. However, there are some practitioners that do not share the same opinion that additional resources have a direct correlation to increases in student achievement.

Hanushek (1989) conducted a study that concluded that there is no strong or systematic relationship between school expenditures and student performance. Hanushek noted that school divisions do not effectively use funds that are allocated to

improve the learning environment. The ongoing debate between Hanushek and Greenwald, Hedges and Laine is one that is noted in facilities research. The belief that methodologies utilized in the individual studies are accurate proves to be one of considerable debate. Alexander and Salmon (1995) also questioned the suitability of Hanushek's input-output model when analyzing educational outcomes. This model, usually used in the business sector, equates the value of the output of a process relative to the value of the inputs used for production. In an educational setting, Hanushek theorized that increasing expenditures for teacher salaries and instructional materials should produce a corresponding increase in student achievement. However, applying this model to a non-industrial activity such as learning was not appropriate because of the lack of exacting definitions for the variables being studied.

Wenglinsky (1997) examined how educational expenditures improve student performance and how wasteful spending could be reallocated to assist in this process. Wenglinsky noted in his study how a poor district could eliminate unnecessary spending and use these funds to improve achievement. Wenglinsky used national assessments as a basis to evaluate the effectiveness of his study. Analysis of fourth and eighth grade achievement improved for the city of Newark. Department of Education and Employment (2001) adds a different perspective to the debate of whether money matters. This study consisted of a literature review of at least 54 studies, many of which were conducted in the United States to examine the impact of capital investment and academic achievement. The methodology of this study was both qualitative and quantitative. From a quantitative perspective, the study indicates that there are mixed reviews when weighing capital investment and student performance. Some studies find

positive relationship, some find negative relationships, however, there are some that find no relationship at all. From a qualitative prospective, the consensus among the many interviews conducted reveal that there is a strong link between school expenditures and student achievement.

Elliott (1998) conducted a study entitled *School Finance and Opportunities to Learn*, this study linked U.S census data on school finance to data from the National Education Longitudinal Survey of 1988 to evaluate the process through which financial resources affect opportunities to learn in U.S. public high schools. The study focused on three specific questions as it relates to opportunities to learn or (OTL); Does educational expenditures affect students' achievement? What components of opportunities to learn affect students? If funds are allocated for the most critical components of OTL, do students learn more? The findings of this study indicated several ways in which resources are being used effectively in U.S. public high schools. Both the math and science analyses confirm that money matters and that teaching practices and classroom resources matter, but it is only in the science analyses that the mediating effect between finance and achievement of teaching practices and classroom resources is demonstrated. This study provides firm support for the position that money does, in fact, affect students' achievement. Cohen, Chew, and Millman (1975) presented a different prospective; they examined educational inputs and outputs; this study challenged the notion that more is better. The researchers indicated that when input-output techniques are used as management tools in education the students are viewed as the unit of analysis. Other factors such as soci-economics and soci-cultural variables

have a tendency to impact performance. The research in this study did not show a strong correlation between money invested and student achievement.

It is evident that research in this area must continue; the findings with regards to educational funding and student achievement present diverse outcomes. The opportunity to explore how funding in the three areas of facilities, maintenance and operation, and debt service impact selected school divisions in the Commonwealth of Virginia could prove to be critical in understanding the dynamics associated with educational funding. As mentioned in the findings included in this study the dynamics which determine whether additional financial resources equals increased academic achievement is one that is debatable; however, for the purpose of this study the position is that money does matter in k-12 education. Whether this money is designed to improve achievement, or school buildings, it matters. Researchers such as Wenglinsky (1997) present evidence that indicate that it is not the amount of money that is earmarked for improvement that matters; it's rather how this money is spent that matters when looking for true improvement.

Greenwald & Hedges, (1996), Department of Education and Employment (2001), and Wenglinsky (1997) all concluded that there is a relationship between financial expenditures and student achievement. The research conducted in each of these studies indicates that there is a correlation between financial expenditure and student achievement. Department of Education and Employment (2001) concludes from quantitative research that there is a relationship between capital spending and student performance. Statistically, the Pricewaterhouse study does acknowledge the relationship is relatively weak. From a qualitative prospective, the theory of whether

there is a relationship between financial expenditures and student achievement proves to be stronger. The interviews conducted in this study do provide evidence that supports the theory that capital expenditures do have a positive relationship on student achievement.

Greenwald & Hedges, (1996) conducted research that support the theory that money that is spent to reduce class size, attract and retire highly qualified teachers, and create smaller schools are all factors that lead to increases in student achievement. They concluded that the variables that attempt to describe the quality of teachers, such as teacher ability, teacher education and teacher experience show very strong relationships with achievement. Elliott (1998) concluded that money does matter in the effort of improving achievement; the researcher also noted that teaching practices and classroom resources also contribute to improvement in academic achievement.

Wenglinsky (1997) collected data for this study from three sources, (1) the National Assessment of Educational Progress (NAEP), a national representative sample of fourth and eighth graders who took achievement examinations in mathematics and were asked questions pertaining to their background characteristics and the climate of the school; (2) the Common Core of Data, a database of school finance information collected by the U.S. Department of Education from all school districts in the nation; and (3) the Teacher's Cost Index, also developed by the U.S. Department of Education, which measures variations in the cost of education between states (Wenglinsky, p. 1).

He found evidence that resources spent with the hope of improving achievement, did have a positive effect on fourth and eighth grade achievement which were the

subgroups within that study. Money spent on other factors that could possibly lead to increases in overall achievement such as reducing student-teacher ratios and addressing pressing capital needs such as building or renovating facilities, contributes to the objective of raising student achievement. Components such as social-economic status and the level of parental involvement also played major roles on the level of achievement for fourth and eighth grade students. Money spent to provide sound educational programs to address the cognitive development of young students, such as pre-K or head start, provides school divisions a real opportunity to move forward with promoting high academic achievement for all.

An examination of the question of whether capital funds would result in better facilities for students was explored in only one of the studies examined in this review. Department of Education and Employment (2001) quantitative analysis consisted of a correlation analysis that focused on capital investment and pupil performance. This section of the study examined the impact of capital investment and pupil performance. In essence, it reviewed the pupil performance of schools that received funds for capital improvements verses schools that did not receive funds for capital projects. Over a two year period 1993-1995 several schools were examined to determine whether there was a relationship between capital investment and achievement. Schools were divided into two distinct categories; Capex schools and Control schools. Capex refers to the schools that received funding for capital improvement and control schools referred to schools that did not receive funding during the two year time frame. Primary schools and secondary schools were used in the study.

Pricewaterhouse concluded by indicating that there was some evidence of a statistically significant relationship between capital investment and pupil performance. The general attitudes, behavior and relationships amongst pupils and staff are more conducive to learning in those schools which have had significant capital investments. One thing that is clear; further research must continue in this area to quantify existing and future trends in the area of financial ability and building conditions.

CHAPTER 3

METHODOLOGY

This chapter presents the methodology section of the study. The chapter identifies the participants of the study; enumerates the data collection and the analysis of data. Collection of data is essential in providing the resources needed to strengthen the investigative portion of the study. The analysis of data could possibly provide possible correlations between financial ability and building conditions.

The variables of leadership and financial ability serve as important factors to understanding the condition of school buildings. The leadership of the school division has certain expectations about how well the school buildings should be maintained and how they should look. These variables influence the eventual condition of buildings. Because there is no control for these variables in the study, results of the study may not represent the full nature of the relationship. Financial ability, as defined in this study, may not completely represent the total ability of a school division to provide adequate safe and modern school facilities.

Population

The school population of this study was taken from research conducted by Crook (2006). Crook's study was designed to examine the relationship between student achievement and the condition of buildings that were assessed as being either standard or substandard when controlling for socioeconomic status of the student body. A total of 299 high schools that included grades 9-12 in the Commonwealth of Virginia were asked to participate in the study. All schools with an 11th grade class were included in

the study. Alternative and vocational schools were not included in the study. The total population for this study consisted of 293 high schools that have an 11th grade in the student population (p. 50).

The Commonwealth Assessment of Physical Environment (CAPE) was used to determine the current condition of each of the grade 9-12 high schools in the study. This assessment instrument was developed by Cash (1993). It has been utilized in previous studies regarding the relationship between student achievements and building condition rating. School buildings are rated based upon an assessment of the building by the principal (Crook p. 51). A total of 27 questions concerning building conditions are used in this instrument. A total score representing the condition of the school building can be derived from the CAPE.

A response category was established for each of the 27 CAPE assessment items. Each school building was identified and placed in an SPSS database. After determining the total assessment score for each school building, the results were entered into a continuum from low to high score. The top and bottom quartile (25%) of schools were identified as the two groups of buildings that constituted the population from which the percentage of students passing the SOL examinations were compared (p. 60). These schools were used by Crook in his study.

Item 25 of the CAPE asked principals in Crook's study how they would rate the condition of their school buildings; three choices were provided, below standard, standard, and above standard. An analysis of responses to this item revealed that 11 principals rated their schools as standard. This set of buildings was matched with 11

other buildings in which the Principal assessed their buildings as being substandard. This set of 22 school buildings constituted the population for this study. This population of schools represented the extremes of the total population that Crook used and provided a better comparison of schools that had opposite ratings. For the purpose of this study the classification of schools were listed as satisfactory and unsatisfactory.

Since principals spent a great deal of time in their buildings, it is logical that they would have knowledge about the physical condition of their buildings. The assessment of building conditions is necessary to provide an environment that is conducive to learning. No other person in the school division is more qualified to give an accurate and realistic assessment of building conditions than the high school principal. A study conducted by Brannon (2000) indicated that principals are more reliable in assessing building conditions than any other member of school leadership; superintendents or school board members. The poor rating of these schools is significant because principals normally rate their buildings as being satisfactory.

It is possible for school divisions to have both good and poor school buildings. Rural school divisions typically have a preponderance of poor buildings. Although urban and suburban school divisions generally have a larger tax base than rural schools, it is still a possibility for poor building conditions among school divisions. Baltimore and Chicago are two cities that are classified as large urban school divisions; however, they are generally believed to have poor buildings for school age children. Reports by the United States General Accounting Office (1995) have recently shared the plight of various schools divisions across the country. The state of New Jersey was forced by the courts to abandon their funding formula for financing schools. The courts ruled in Abbott

v. Burke II, (1990) that the state must fund urban schools equally. Prior to this ruling, suburban schools were receiving the bulk of funding from the state.

It would not be possible to identify a building in unsatisfactory condition in a school division and then determine exact amounts of funds used for the repair and upkeep of that particular building. This is because school division funding does not identify funds used for specific buildings. For example, it is a common practice in public school divisions to fund projects such as window or roof replacements for a number of different buildings under one construct.

Data Needs

Two sets of data were needed to complete the study. First, the study required data on high school building condition in the Commonwealth of Virginia which was obtained by research conducted by Crook (2006). A total of 293 high schools in the state of Virginia were included in the population in his study. However, for the purposes of this study, the top 11 schools that have been rated as being in satisfactory condition and those 11 schools that were rated as unsatisfactory by their principals served as the population.

The second set of data obtained for the study was the measures of financial expenditures of local school divisions that are reported annually to the Virginia Department of Education. Data used in this study came from two categories of the local operating budgets of the selected school divisions as reported to the Virginia Department of Education. Financial information on facilities and debt services were utilized in the analysis. The Superintendents' Annual Report contained data in all

categories of the local school division report for every school division in the Commonwealth.

The facilities section of the local school division operational budget represent funds expended to complete capital improvement projects. Data for the five year period of fiscal years 2000-2001 to 2004-2005 was used to make comparisons. The five year time frame was instrumental in providing data needed to analyze financial trends of the identified school divisions. Crook identified the buildings used in his study in 2005; therefore the financial data of the school divisions for the five previous years will be used. For the purposes of this study, data for the 2000-2005 school years were used to examine expenditures because this was the timeframe that would provide some sense of significance with regards to the per-pupil cost of the schools categorized as satisfactory or unsatisfactory.

Debt Services is a section of the local operating budget that reflects the payment the school board makes for bond and lease rental payments and state technology and construction loan payments. For the purpose of this study debt services was used in relation to all payments for all capital improvement projects.

Data Analysis

The data analysis of this study consisted of an evaluation of the financial expenditures of local school divisions that are rated in the study as satisfactory and unsatisfactory by the CAPE survey in Crooks' study. Two areas of the local school divisions' budgets were used; these areas are facilities and debt services.

The total funds expended in facilities and debt services were extracted from the Superintendents Annual Report for each school division for each year. The total funds for each category were aggregated. Total funds for each fiscal year and for each school division were summed; the means found for each category was presented in the study. The results for each school division in the two building groups were aggregated for total enrollment of the school division. The total funds spent in the two budget categories were divided by the total enrollment for all of the school divisions for each of the five years.

A per-pupil cost was determined for the two groups of schools for each year. As a result, there is a per-pupil expenditure for each of the two groups of buildings for each of the years 2000-2005. The per-pupil cost factor is a more equitable measure to use in making comparisons between groups.

A t-test was used to explore the statistical difference between the two groups identified in the study. A *p* value of .05 was used to determine the level of significance between the per-pupil costs for each year of the school divisions. For the purposes of this study, the t-test analyzed the means of the total expenditures for a five year period beginning with the 2000-2001 academic year. Total funds spent on facilities and debt services for each school division provided the data needed for analysis of funding and spending practices during the five year time frame.

Tables showing the amount of money spent in each area for each year provides the documentation needed to support the calculation of per-pupil expenditure for the divisions that are classified as satisfactory and unsatisfactory within the study.

The third research question addressed the possible difference in financial ability of the school divisions as measured by the Local Composite Index, and the quality of the school buildings. To answer this question the Local Composite Index for each of the twenty-two school divisions in the two building categories were obtained from the Department of Education. The Local Composite Index scores were aggregated for school divisions in the poor building category and the good building category. These indices were summed and a mean Composite Index factor for the two categories of schools was obtained. A simple t-test analysis was done to determine if there was a significant difference between the two mean scores. This procedure was used as a comparison measure to determine if there was a difference in financial ability between the two groups of school divisions.

CHAPTER 4

DATA ANALYSIS

Introduction

The process of analyzing data began with determining the level of spending in the two financial line items in the local school budget of facilities and debt service for the five year period of 2000-2001 through 2004-2005. Per-pupil expenditures in the two budget categories were developed for use in the study. Tables were developed which included the total expenditures of each of the two line items of the 22 school divisions selected for this study.

It is important to note that each local school division in both categories could possibly consist of several high schools within a division. The physical conditions of these schools could have an influence on the level of expenditures of each of the financial line items during the specified five year timeframe within this study. All data were collected from the annual Superintendent's Reports of the Virginia Department of Education for the academic years of 2000-2001 through 2004-2005.

Three research questions were posed to guide statistical analysis using SPSS. An independent samples t-test was used to compare means of the expenditures in facilities and debt services expenditures of selected subgroups within this study. In addition, the Local Composite Index (LCI) for each school division was used as a measure of control for the financial ability of each school division. The means of the LCI of the 11 school divisions with unsatisfactory buildings was compared to the mean of the LCI of the school divisions with buildings rated as satisfactory. In addition, the Virginia Education

Association fiscal capacity and fiscal effort index were used to compare the two groups of school divisions to ascertain if there were any differences between the school divisions. Reports of statistical outputs are presented to indicate whether or not there was a statistical relationship on test variables within the school divisions that have buildings that are assessed as satisfactory and unsatisfactory during the five academic years of 2000-2001 to 2004-2005.

Findings

The following tables represent the expenditures of two financial budget line items: facilities and debt services. Per-pupil cost for each line item was determined for the five year period of 2000-2005. Per-pupil cost was determined by dividing total enrollment into the amount of funds spent in each line item for each year for school divisions with buildings classified as satisfactory and unsatisfactory. Analysis of financial data determined if the amount of funds expended on these financial budget line items presented significant differences during the selected school years. An explanation of the finding follows each set of tables.

Facilities

This section presents data concerning expenditures of the facilities section of the local school operating budget for capital improvement projects.

The facilities line item as defined in this study is the section of the local school division budget that represents funds expended to complete capital improvement projects. These funds could be used for the renovation of existing buildings or the construction of new facilities.

A school division can spend up to 50 percent of lottery money on operations and no less than 50 percent on construction. The Literary Loan Fund is a special source of monies that schools must apply for. It is a loan program with the interest rate linked to the Local Composite Index. The money can be used for new construction only, and the limit for any one district is \$7.5 million. The maximum indebtedness to the Literary Loan Fund for any division cannot exceed \$20 million. This is basically monitored by the Virginia Public School Authority (VPSA). The VPSA was formed to help localities overcome many of the problems associated with borrowing money for school construction projects. This agency has the ability to lend higher amounts of money on a less restrictive basis for school construction and renovation projects (VDOE).

An analysis of per-pupil expenditures for the facilities section of the study which focused on school buildings assessed as being in satisfactory and unsatisfactory condition is provided. Table 1 provides data relative to the total expenditures in the facilities section of the local budget for the two groups of school divisions. In addition, the table shows the total expenditures broken down into per pupil costs and also the results of the statistical analysis for total expenditures.

As can be seen from the table, the school divisions with satisfactory buildings spent more funds each year than did school divisions with unsatisfactory buildings. This is then borne out in the per pupil costs where the school divisions with satisfactory buildings spent more per pupil each year than did the other school divisions.

Table 1

Per Pupil Expenditures and Significance for Facilities Section in School Buildings

Assessed as being in Satisfactory and Unsatisfactory Condition 2000-2005.

Year	School Division	Facilities	Per-Pupil Expenditure	Sig.(2 Tailed)
2000-2001	Unsatisfactory	84,984,819	752	.402
	Satisfactory	206,520,480	1,239	
2001-2002	Unsatisfactory	62,511,286	559	.303
	Satisfactory	178,220,833	1,044	
2002-2003	Unsatisfactory	40,531,721	362	.140
	Satisfactory	204,678,798	1,182	
2003-2004	Unsatisfactory	42,832,535	385	.182
	Satisfactory	234,026,931	1,308	
2004-2005	Unsatisfactory	49,373,000	446	.131
	Satisfactory	210,169,920	1,114	

*Significance-p<.05

Analysis of data indicated that school divisions with satisfactory buildings spent a total of \$3,383 per pupil more than school divisions with unsatisfactory buildings for the five year period as it relates to the facilities line item of local school division budgets.

School divisions with satisfactory schools spent on average \$753 million more on facilities than unsatisfactory schools. Further analysis listed the reported spending amounts between school divisions with buildings listed as satisfactory and unsatisfactory per year beginning with the academic year of 2000-2001. Per-pupil cost and the significance of spending is illustrated in the table. These figures represented the total amount of expenditures for the facilities line item for each year divided by the total student enrollment. An independent t-test was conducted to analyze the expenditures related to the financial line item. The *p* value or Sig. on the independent t-test represented the total expenditures of the facilities line item over a five year period. The findings indicated that there was no significant statistical difference in total expenditures for any of the five years on facilities between school divisions with buildings classified as satisfactory or unsatisfactory.

Table 2 displays findings that focused on a comparison of mean per-pupil expenditures for the facilities line item of local school divisions with buildings classified as unsatisfactory and satisfactory during the five year period of 2000-2005. The results of an independent t-test presented substantial statistical significance with a *p* value of (.000*) in mean per pupil expenditures.

Table 2

A Comparison of Mean Per-Pupil Expenditures for the Facilities Line Item of Local School Divisions with Buildings Classified as Unsatisfactory and Satisfactory During the Five Year Period of 2000-2005

<i>Group</i>	<i>Years</i>	<i>Mean</i>	<i>Sig.</i>	Sig.(2-tailed)
Unsatisfactory	5	500	.032	.000*
Satisfactory	5	1177		

*Significance- $p < .05$

In Table 2, the Levene test for equality of variance indicates a Sig. of (.032) which indicates that it can be assumed that there is equal variance between local unsatisfactory and satisfactory school divisions. The p value of (.000*) indicates that there is strong statistical significance of mean per-pupil expenditures of school divisions with satisfactory and unsatisfactory buildings.

Debt Service

Debt service, as defined for the purpose of this study, represents the amount of money used to make all payments on the debt for all capital improvement projects. Included in this fund are expenditures for principal, interest, and fees. Table3 displays the total amount of expenditures for the financial line item of debt services during the years of 2000-2005. Per-pupil cost of satisfactory and unsatisfactory schools were developed.

Table 3

Per Pupil Expenditures and Significance for Debt Service in School Buildings Assessed as Being in Satisfactory and Unsatisfactory Condition 2000-2005

Year	School Division	Debt Service	Per-Pupil Expenditure	Sig. (2 Tailed)
2000-2001	Unsatisfactory	16,929,504	149	.025*
	Satisfactory	97,064,716	582	
2001-2002	Unsatisfactory	15,909,999	142	.254
	Satisfactory	120,021,012	703	
2002-2003	Unsatisfactory	15,490,188	138	.073
	Satisfactory	127,818,169	738	
2003-2004	Unsatisfactory	15,470,350	139	.070
	Satisfactory	142,029,567	794	
2004-2005	Unsatisfactory	14,954,716	135	.214
	Satisfactory	234,777,194	1,244	

*Significance-p<.05

Data in the above Table 3 indicate that the annual expenditure for debt service was larger in school divisions with satisfactory school buildings compared to school divisions with unsatisfactory buildings. Each year divisions with satisfactory schools spent more on debt service than school divisions with unsatisfactory schools. School divisions with satisfactory schools also outspent divisions with unsatisfactory schools on per-pupil expenditures during the five year period of 2000-2005. The difference in level of spending on debt service for school divisions with buildings assessed as being satisfactory was \$642.9 million more than school divisions with schools assessed as being unsatisfactory. The average per-pupil expenditure was approximately \$3,358 more than that of unsatisfactory schools. The level of spending indicates that the school divisions with satisfactory buildings during this time period had a larger level of debt for capital improvement projects than school divisions with unsatisfactory buildings.

An independent t-test indicated that there was significant statistical difference in the total level of expenditures for debt services for the 2000-2001 school year. However, the analysis did not indicate that there was a significant difference in the remaining four years of the study for the line items of debt service.

Table 4 displays an analysis of the five year average per-pupil expenditures for the debt service line item of local school divisions within the study. This table shares the results of statistical analysis which indicates the statistical difference in expenditures between unsatisfactory and satisfactory school divisions.

Table 4

A Comparison of Mean Per-Pupil Expenditures for the Debt Service Line Item of Local School Divisions with Buildings Classified as Unsatisfactory and Satisfactory during the Five Year Period of 2000-2005

<i>Group</i>	<i>Years</i>	<i>Mean</i>	<i>Sig.</i>	Sig.(2-tailed)
Unsatisfactory	5	140	.051	.000*
Satisfactory	5	812		

*Significance: $p < .05$

An independent t-test was conducted to determine whether there was a significant difference in the level of per-pupil expenditures for school divisions with buildings assessed as being unsatisfactory compared to school divisions with buildings assessed as satisfactory. The Levene test of equality for variance indicates a Sig. of (.051) which indicates that it can be assumed that there is equal variance between school divisions with buildings assessed as unsatisfactory and satisfactory schools. Further analysis reveals a p value of (.000*) which indicates that there is a significant statistical difference between mean per-pupil expenditures of school divisions with satisfactory and unsatisfactory schools.

Local Composite Index

The Local Composite Index is a measure of fiscal capacity used in the Commonwealth of Virginia for the purposes of fund allocation and distribution. The index is a ratio of the true value of real and public service corporation property, adjusted gross income, and taxable retail sales receipts of the local school division to the aggregate measures of the state. The Local Composite Index is reported as a ratio of the financial ability of the local school division to that of the State Composite Index and is therefore displayed as a percentage of less than 1.00%.

The VEA measures of capacity and effort in this study are based upon the components of the Local Composite Index (LCI). The LCI components include adjusted gross income and taxable retail sales in addition to true property values to determine a locality's ability to pay for public education. In the VEA calculation, local composite index values are converted to dollar amounts of local fiscal capacity so that they can be related to local fiscal effort. Fiscal effort is a measure of the total local expenditures for school operations correlated to school enrollment and population. This approach allows comparisons to be made between the ranking of a local school divisions' capacity and its local fiscal effort (Virginia Education Association Research Services 2009).

Fiscal Effort

Fiscal effort refers to the relative extent to which a locality utilizes the revenue resources available to its fiscal or revenue capacity. It is most often used to evaluate or describe the intensity of the attempt of one locality to raise revenue relative to the other comparable localities. High tax effort can be the result of mandatory or basic spending requirements in a relatively tax poor location. In such a situation high tax rates are the only solution for raising the necessary revenue (Stanley 2007).

Data obtained from the Virginia Education Association provided fiscal effort and ranking for all school divisions in the Commonwealth of Virginia for the years of 2000-2005. For the purpose of this study, twenty-two school divisions categorized as satisfactory and unsatisfactory were examined.

Fiscal Capacity

Fiscal capacity is a quantitative measure intended to reflect the resources which a taxing jurisdiction can tax to raise revenue for public purposes. The capacity of a people to contribute to the support of their government is determined by many factors including the population's total resources, its income, wealth, and business activity (Advisory Commission on Intergovernmental Relations 1962).

Reeves (1986) provided additional insight on the information presented by the Advisory Commission on Intergovernmental Relations (ACIR) in reference to the inadequacies of per capital income as a measure of fiscal capacity. The commission presented the Representative Tax System for measuring state tax capacity. The RTS provides a sophisticated yet understandable approach to measuring state-local fiscal

capacity. The second major advantage of the Representative Tax System is that it is far more sensitive than the per capita income measure to changes in the economic and fiscal condition of states that affect their tax bases.

The Virginia Education Association compiles data relative to the financial capacity and effort of all school divisions in the Commonwealth of Virginia. In Table 9 the fiscal effort of unsatisfactory and satisfactory school divisions during the years of 2000-2005 is displayed. The current study examines actual expenditures of school divisions; therefore, the VEA measure of fiscal effort is an appropriate measure of the local expenditures for school operations related to school enrollment, population, and capacity. The VEA provides information on all school divisions in the Commonwealth of Virginia on fiscal capacity and fiscal effort. School divisions are ranked according to expenditures recorded on a yearly basis. Fiscal capacity measures the ability of a locality to fund educational services, as contrasted to the fiscal effort which is a measure of the willingness of the locality to fund educational needs. (VEA)

Table 5

Comparison of the Virginia Education Association Fiscal Effort of Unsatisfactory and Satisfactory Buildings – 2000-2005

School Division	2000-01	2001-02	2002-03	2003-04	2004-05
Unsatisfactory					
U1	1.6116	1.4885	1.3673	1.4418	1.1461
U2	0.9698	0.9085	0.8720	0.9813	0.9508
U3	1.3925	1.5838	1.5030	1.2571	1.1099
U4	1.0829	0.5176	1.0477	1.0625	0.9862
U5	2.8688	2.0867	1.3114	1.3380	1.2082
U6	1.1819	1.3047	1.2528	1.1691	1.2620
U7	1.4974	1.6536	1.7700	1.6183	1.3600
U8	1.5207	1.7223	1.8539	1.6501	1.2720
U9	1.3870	1.5399	1.3828	1.3647	1.2222
U10	2.0138	2.2093	1.9715	2.2134	1.8747
U11	1.1320	1.1687	1.0465	1.2179	1.0541
SUM	16.6584	16.1836	15.3789	15.3142	13.4462

Table 5 (continued)

Satisfactory Schools	2000-01	2001-02	2002-03	2003-04	2004-05
S1	1.5815	1.7944	1.5904	1.7814	1.4257
S2	2.1665	2.4491	2.2286	2.5511	2.0328
S3	1.7170	1.8598	1.6303	1.7923	1.5848
S4	1.8074	1.7173	1.6304	1.9118	1.4565
S5	1.9334	2.1309	1.9067	2.0541	1.5248
S6	2.9217	3.6168	3.1089	3.0223	2.7194
S7	1.4260	1.5161	1.2735	1.3625	1.1618
S8	2.8235	2.9285	2.8872	3.1986	2.6218
S9	1.9630	1.9753	2.0180	1.8691	1.6897
S10	1.5907	1.6404	1.6301	1.8131	1.6043
S11	2.6973	2.6372	2.6841	2.5067	2.2538
SUM	22.628	24.2658	22.5882	23.863	20.0754

Table 5 provides the level of fiscal effort of the 22 school divisions examined in this study with buildings classified as unsatisfactory or satisfactory. Fiscal effort relates the wealth of a community to its educational expenditures. The table provides data that indicate that all school divisions, except one in both groups had a lower fiscal effort rating in the last year than in the first. There could be any number of reasons for such a change; tax base changes over the five year period, additional tax burdens could be a

factor, changes in school population or enrollment could also contribute to the reported findings.

The demographics reflective of the classification of school divisions could be another factor to consider when examining the change in fiscal effort. High tax effort can be the result of mandatory or basic spending requirements in a relatively tax-poor location. The table was designed to show the reported fiscal effort of the school divisions classified as satisfactory and unsatisfactory (VEA).

Table 6

A Comparison of Sum of the Mean Fiscal Effort for Local School Divisions with Buildings Classified as Unsatisfactory and Satisfactory from 2000-2005

<i>Group</i>	<i>Divisions</i>	<i>Sum of Mean</i>	<i>Sig.</i>	Sig. (2-tailed)
Unsatisfactory	11	15.3963	.650	.000*
Satisfactory	11	22.6841		

In Table 6, an independent t-test was used to analyze the mean of fiscal effort between school divisions with buildings classified as satisfactory or unsatisfactory from 2000-2005. The Levene's Test for Equality of Variances reveals a Sig. (.650) which indicates that it could not be assumed that there is equal variance between school divisions with buildings assessed as unsatisfactory and satisfactory schools. The *p* value of .000* reveal strong statistical significance in the mean of fiscal effort between

school unsatisfactory and satisfactory school divisions. These findings indicate that there was a significant difference in the effort associated with school divisions with buildings assessed as being in satisfactory condition and those school divisions with buildings assessed as being in unsatisfactory condition. Local expenditures of satisfactory divisions proved to be greater according to ADM figures, composite numbers and the population of the locations in which these school divisions are found.

Fiscal Capacity measures the ability of a locality to fund educational services. Table 7 illustrates that in both unsatisfactory and satisfactory school divisions the fiscal capacity increased over the years. Both unsatisfactory and satisfactory school divisions increased over the five year period of the study. The Fiscal capacity remained the same for a two year period without change. The table revealed two increases during the five year period. The implication of this table indicates the wealth of the communities in which the divisions are located is a major factor that contributes to the increases observed in the table. Localities uniformly use the local property tax to fund schools. Home values, as measured by the property tax, may not be the best measure of capacity to fund schools; nevertheless, it is the tax that is the source of local school funds. Income is the common measurement of wealth of a community. The presence of business and industry could also be a variable to consider when determining the capacity of localities to fund schools.

Table 7

Comparison of the Virginia Education Association Fiscal Capacity of Unsatisfactory and Satisfactory Buildings – 2000-2005

School Division	2000-01	2001-02	2002-03	2003-04	2004-05
Unsatisfactory					
U1	60,793	60,793	66,601	66,601	76,687
U2	290,587	290,587	303,666	303,666	324,708
U3	65,726	65,726	73,494	73,494	81,750
U4	45,913	45,913	56,941	56,941	63,126
U5	42,985	42,985	46,215	46,215	62,216
U6	56,716	56,716	60,372	60,372	65,720
U7	39,406	39,406	49,449	49,449	55,625
U8	55,732	55,732	63,596	63,596	72,203
U9	69,038	69,038	74,649	74,649	88,936
U10	58,863	58,863	64,011	64,011	74,868
U11	65,310	65,310	70,117	70,117	84,849
SUM	851,069	851,069	929,111	929,111	1,050,688

Table 7 (continued)

Satisfactory Schools	2000-01	2001-02	2002-03	2003-04	2004-05
S1	86,377	86,377	99,883	99,883	123,837
S2	64,189	64,189	70,828	70,828	84,739
S3	78,421	78,421	89,688	89,688	101,346
S4	62,592	62,592	68,374	62,592	82,348
S5	61,194	61,194	65,228	65,228	77,770
S6	109,796	109,796	129,228	129,228	161,235
S7	65,177	65,177	72,288	72,288	85,518
S8	53,196	53,196	60,329	60,329	81,756
S9	46,775	46,775	50,445	50,445	58,009
S10	46,124	46,124	49,997	49,997	58,665
S11	57,301	49,997	62,169	62,169	73,129
SUM	731,142	731,142	818,397	818,397	988,352

Table 7 reveals that school divisions with unsatisfactory buildings had greater fiscal capacity to fund schools than school divisions with satisfactory buildings during the years of 2000-2005. This seems to be a reversal of fortune. Many of the unsatisfactory school divisions in this category are located in rural areas. One would think that if the school division is located in rural areas, the ability to fund schools would be limited. The complexity of computing fiscal capacity varies throughout the state with

regards to per capita income, and property value of the various communities. Not all school divisions have the same school funding ability.

Table 8

A Comparison of Mean Fiscal Capacity for Local School Divisions with Buildings Classified as Unsatisfactory and Satisfactory from 2000-2005

<i>Group</i>	<i>Divisions</i>	<i>Mean</i>	<i>Sig.</i>	Sig. (2-tailed)
Unsatisfactory	11	922,209	.764	.116
Satisfactory	11	817,486		

Table 8 provides data that evaluated mean fiscal capacity of local school divisions with buildings classified as unsatisfactory and satisfactory from 2000-2005. An independent t- test reveals a *p* value of (.116) which indicates that there is no statistical difference in the mean of fiscal capacity between satisfactory and unsatisfactory school divisions. Unsatisfactory school divisions had a higher mean fiscal capacity than satisfactory school divisions. The table supports the implication that unsatisfactory school divisions had greater level of fiscal capacity during the five years of the study. Yet, these same school divisions provided less financial support for school buildings as measured by the VEA fiscal effort index as found in Table 5.

A review of findings revealed no statistical significance with regard to the Local Composite Index for any year of the study. These findings mirror the statistical results

associated with the comparison of mean fiscal capacity of school divisions with buildings classified as satisfactory and unsatisfactory.

As a means of summary, the five years of total expenditures for facilities and debt services were summed and a mean derived. This mean was compared using an independent t-test to determine significance.

Table 9 illustrates total expenditures of school divisions with building classified as satisfactory and unsatisfactory. The per-pupil mean was derived by dividing total enrollment into total expenditures. Statistical significance was determined by conducting a paired sample t-test of total expenditures and per-pupil mean of each financial line item. Statistical significance was found in an analysis of total expenditures for all budget categories within the study. Analysis of these budget line items indicated strong significance with p values of (.000*) for facilities, and (.001*) for debt service.

An independent t-test was conducted to determine the significance of per-pupil mean expenditure for each financial line item. Strong statistical significance was found in both the facilities and debt service financial line items with a p values of (.000*) respectively.

Table 9

Five Year Total Expenditures for Facilities and Debt Service and Per-pupil Spending of Local School Divisions with Buildings Classified as Satisfactory and Unsatisfactory 2000-2005

Year	School Division	Total Expenditures	Sig. (2 Tailed)	Per-Pupil Mean	Sig. (2 Tailed)
Facilities					
2000-2005	Unsatisfactory	280,233,361	.000*	500	.000*
	Satisfactory	1,033,616,965		1177	
Debt Service					
2000-2005	Unsatisfactory	78,754,757	.001*	140	.000*
	Satisfactory	721,710,658		812	

*Significance: $p < .05$

CHAPTER 5

SUMMARY OF FINDINGS, DISCUSSION, CONCLUSIONS, IMPLICATIONS, RECOMMENDATIONS FOR FURTHER STUDY

Introduction

The purpose of chapter five is to address the research question, Is there a relationship between the financial expenditures of local school divisions and school building conditions in the Commonwealth of Virginia? This chapter presents a summary of findings, and a conclusion based on these findings. Chapter five concludes with recommendations for further study.

The population of this study was found in research conducted by Crook (2006). Crook investigated the possible relationship between the physical condition of school facilities and SOL performance. Crook surveyed 198 principals of Virginia High Schools that served 11th grade students. The CAPE assessment instrument was used by principals to determine buildings conditions. The high schools assessed during Crook's study were listed as either standard or substandard according to the results of the CAPE instrument. The high schools that ranked in the top and bottom quartile of the survey were used to determine the school divisions that would serve as the population of this study. For the purposes of this study, the categories of school divisions were referred to as satisfactory and unsatisfactory.

The theoretical model used by Cash (1993) was the basis of this study. The elements of leadership, financial ability and building conditions as expressed in the theoretical model were explored. This study specifically investigated that section of the theoretical model that expressed the possible relationship between the financial ability of the local school division and the condition of the school building.

Major data components used in the study were provided by the Virginia Department of Education. The annual Superintendent reports provided information pertaining to the two major budget line items of facilities and debt service which were used to make the comparisons with school building condition. Data for the period of time of 2000-2005, were used in the analysis. This is because the school buildings were assessed in 2005.

A number of statistical tests using SPSS were used to analyze the data to answer three research questions. An independent samples t-test was used to compare the means of expenditures for facilities and debt service within this study. In addition, both the Local Composite Index and the VEA Fiscal Capacity and Fiscal Effort index for each school division was used as a measure of control for the financial ability of each school division. The mean of the LCI of the 11 school divisions with unsatisfactory buildings was compared to the mean of the LCI of the 11 school divisions with buildings rated as satisfactory. The VEA Index indicated that there was a difference in Fiscal Effort between the two groups of schools, but for the Fiscal Capacity, there was no significant difference found between the two groups of school divisions. Reports of statistical outputs were reported to indicate whether or not there was a statistical relationship on test variables within the school divisions that had school buildings that

were assessed as satisfactory and unsatisfactory during the academic years of 2000-2005.

Summary of Findings

The two local school budget line items of facilities and debt service were used in this study to explore the possible relationship between financial expenditures and school building condition. Expenditures within these line items were analyzed over the five year period of 2000-2005. Both total expenditures and per-pupil costs were the measures used for analysis in an effort to determine if there is a relationship between financial expenditures and building conditions based on a per-pupil basis.

In addition the VEA Fiscal Capacity and Fiscal Effort indices were used as a measure to ascertain the similarities of the two groups of school divisions. The means of the VEA Fiscal Capacity and Fiscal Effort Indices of each sub group of school divisions were compared to ascertain if there was a difference in local financial ability.

Descriptive statistics were developed to ascertain the expenditure patterns of the school divisions on the two budget line sections. This procedure was done to determine trends in expenditures over the five year period. In addition, the per-pupil expenditures over the five year period were analyzed.

Analysis of the facilities budget line item indicate that local school divisions with satisfactory buildings outspent local school divisions with unsatisfactory buildings every year in total expenditures. School Divisions with satisfactory schools spent on average \$753 million more on facilities during that period of time than school divisions with unsatisfactory schools. Analysis of data indicated that school divisions with satisfactory

buildings spent \$3,383 per pupil more than school divisions with unsatisfactory buildings for the five year period as it relates to the facilities line item of local school division budgets.

Analysis of the debt service budget line item indicated that school divisions with satisfactory buildings outspent school divisions with unsatisfactory buildings in total expenditures and per-pupil cost each year of the study. The school divisions with satisfactory buildings spent \$643 million more than school divisions with unsatisfactory buildings for the five year period.

Total five year expenditures and per pupil expenditures were analyzed using an independent t-test to determine statistical significance of each financial line item.

An examination of the facilities budget line item indicates strong statistical significance with a p value of .000* when analyzing five year total expenditure mean.

An examination of per-pupil cost by year of the facilities budget line item revealed that there was no statistical difference found between school divisions with buildings classified as satisfactory or unsatisfactory. Analysis of five year per-pupil mean, however, indicated that strong statistical significance existed with a p value of .000*.

Analysis of the Debt Service budget line item presented strong statistical significance when examining five year total expenditure mean with a p value of .001*. When examining per-pupil cost by year statistical significance was found for one year only (2000-2001); statistical significance was not found in the other four years of the study dating from (2002-2005). Statistical analysis of five year per-pupil mean reported strong statistical significance with a p value of (.000*).

As a means for review, Table 10 was designed to show in graphic form the areas where either significance or no significance was found as a result of the t-test analysis. For each of the two budget categories a comparison of the separate t-tests for each of the five years was made for total expenditures, per-pupil by year cost, and five year mean of per-pupil expenditures. The table lists whether or not significance was demonstrated for each of these categories.

Table 10

Summary of Significance for Facilities and Debt Service for Local School Divisions with Buildings Classified as Satisfactory and Unsatisfactory 2000-2005.

Financial Line Item	5 yr. Total Expenditure Mean	Per-Pupil By Year	5 yr. Per-Pupil Mean
Facilities	Significance .000*	No Significance	Significance .000*
Debt Service	Significance .001*	Significance .025* 1 year (00-01) No significance years (02-05)	Significance .000*

*Significance- $p < .05$

As a means of recapitulation, t-tests were conducted on each year for the five year period for total expenditures, five year per pupil expenditure means, and per-pupil expenditures for each funding category, facilities and debt service. Additionally, the

means of the five year total expenditure and the means of the five year per-pupil expenditures were analyzed by use of a t-test for each funding category.

An analysis of the five year total expenditure means for the facilities budget line item indicates that strong statistical significance was found with a p value of (.000*). When analyzing per-pupil expenditures annually there was no statistical significance found. Analysis the facilities budget line category of five year per-pupil mean revealed strong statistical significance with a p value of (.000*).

An examination of the budget line item of debt service indicated strong significance with a p value of (.001) for the five year mean total expenditures. For the annual per pupil expenditures, significance was found. During the academic year of 2000-2001 statistical significance was found in per-pupil expenditures with a $p = < .05$ degree of confidence with a p value of (.025*). An analysis of the five year mean of per-pupil expenditures of debt service revealed a p value of (.000*).

Conclusion

The total expenditures for the budget line items of facilities and debt service indicated that school divisions with school buildings classified as satisfactory outspent local school divisions with buildings classified as unsatisfactory every year for five years. The differences on a five year average were statistically significant for both total expenditures and for per-pupil expenditure mean. Analysis of the VEA Financial Capacity Index indicated that there was no significant difference in the local school divisions' ability to fund capital projects, however, there was a significant difference in the Fiscal Effort Index between these two groups of school divisions indicating there

was more fiscal effort expended by school divisions with satisfactory school buildings than there was by the other group of school divisions.

Discussion

The expectations from the inception of this study would be that a relationship between school division expenditures and building conditions would exist among school divisions in the Commonwealth of Virginia. Statistical tests were conducted to determine the significance associated with the expenditures of the two budget line items of facilities and debt service. Statistical significance was found in expenditures over the five years of the study in the two budget line items examined in this study. The hypothesis would be that some statistical significance would present itself when evaluating the line item of facilities on a year by year basis. One would think that there would be some statistical significance to support such a report in this study; annual analysis of the line item did not provide such evidence.

The data within this study clearly showed that there is a relationship between the financial expenditures for facilities and debt service over the five years of the study. The study provided statistical findings that address the statement of the problem and the research questions that served as the foundation of this investigation.

The results of the study consistently revealed that financial expenditures of school divisions with satisfactory school buildings were greater in all budget line items than school divisions with unsatisfactory school buildings four out of the five years when reviewing the line item of debt service. The only exception was during the 2000-2001 school year.

In a discussion with Kent Dickey, Assistant Superintendent of Finance with the Virginia Department of Education it was noted that the 2000-2001 academic year was a very healthy time with regards to state funding. During the early part of the decade the nation experienced a stock market bubble as well as a technology bubble. The economy was stable, this allowed many school divisions to experience an expansion of local school budgets. The 2000-2001 academic year was the time in which state revenue began to recover from many years of financial challenges; this resulted in a substantial increase in state monies. Funds for capital projects were readily available during that time. Many local school divisions realized greater financial contributions from the state. The local real estate markets were weathering the storm, interest rates were very low, and tax exempt rates were attractive (Dickey, 2008). According to Dickey, those factors could explain why there was a difference in the financial expenditures for 2000-2001.

The population of a region could have an impact on local school divisions. If the school divisions are located in an area in which growth is rapid, the demand on housing and providing adequate services to meet the needs of school age children becomes a major priority. Many local school divisions that were identified within this study as having buildings that are satisfactory and unsatisfactory are, located in such areas and have the responsibility of providing buildings that could enhance the educational process. Attracting business and industry to a region could prove to be a positive step in providing a boost to the economy.

Analysis of the line item debt service within this study indicated that local school divisions with buildings that are classified as satisfactory are located in areas that have

experienced rapid growth in their population; this means that there is possibility that schools may be faced with challenges that may stimulate conversations and actions related to capital improvement. It could also be assumed that these school divisions are located in areas in which business and industry help to expand the tax base which could contribute to greater funding opportunities for local schools.

Department of Education and Employment (2001) conducted a mixed methods study in the United Kingdom in 2000 that examined influence of capital investments in schools and student achievement. This research found a strong correlation with capital investment and its influence on three main factors: teacher motivation, pupil motivation, and pupil performance. Quantitative analysis of the Pricewaterhouse study provided evidence of a statistically significant relationship between capital investment and pupil performance. However, in common with others studies, the estimated relationship was relatively weak. The findings of this study indicate strong statistical significance when examining five year total expenditure mean with a p value of (.000*). Analysis of this study provided evidence of a strong statistical significance in the two budget line items of facilities and debt service based on a five year per-pupil mean with a p value of (.000*).

When examining expenditures of the two budget line items of this study some may attribute the disparity in spending practices to the total enrollment or average daily membership of (ADM) of the divisions. Others may attribute disparities in expenditures to the level of business and industry in the geographical regions of the divisions. One could make a case of all these points; however, it really comes back to the components of the theoretical model used in the study and many others that was created by Cash

(1993). The two initial elements within the model, leadership and financial ability, prove to be the driving force in any school division no matter how it is classified. Leadership can be defined as those individuals that are elected or appointed to make decisions that are in the best interest of the locality in which they serve. These decisions could involve fiscal matters that directly affect the school divisions within these localities.

The population of a region could have an impact on local school divisions. If the divisions were located in an area in which growth is rapid; the demand on housing and providing adequate services to meet the needs of school age children becomes a major priority. Many local school divisions that are identified within this study as having buildings that are satisfactory and unsatisfactory are located in such areas and have the responsibility of providing buildings that could enhance the educational process.

The study provided an in-depth look at the expenditures that impact building conditions in the Commonwealth. By examining the two budget line items of facilities and debt service, this study provided a clear picture as to the tremendous amount of money that is required to meet the needs associated with addressing building conditions among public schools in the Commonwealth of Virginia. The school divisions that were selected in this study cover all areas with regards to demographics, VEA Indices, and per-pupil expenditures. Satisfactory schools on average outspent unsatisfactory schools in every budget line item during the five year period. There were no exceptions that were noted in the study, however, the fact remains that on average there was great disparity in the amount of money spent by school divisions that had buildings assessed as being satisfactory over divisions that had buildings assessed as unsatisfactory.

Study Concerns

The study did not include all high schools in the Commonwealth of Virginia. The five year period that was included in this study was sufficient in providing data for an analysis of the two financial line items of debt service and facilities.

The local school divisions with buildings classified as satisfactory and unsatisfactory represented a pendulum of socioeconomics with regards to building conditions among high schools in the Commonwealth of Virginia as it relates to the expenditures for the two budget line items of facilities and debt service. The study does not take into consideration any changes that may have taken place in these localities that may address a shift in financial philosophies. A change in leadership within school divisions or a change of incumbent officials in the city or county could prove to be important factors when studying financial relationships.

This was an exploratory pilot study, which provided data that could prove to be beneficial in providing a baseline of initial data for additional study on the relationship of building conditions and the financial ability of various local school divisions in the Commonwealth. The research did not provide an instrument or method that could be used in determining the conditions that could possibly impact the financial ability of local school divisions that were identified as having school buildings that were classified as either satisfactory or unsatisfactory. Examples of these conditions could be the loss of business or industry which would have direct impact on the tax base of a locality.

Challenges were presented with the inability to identify specific funds expended upon individual buildings which may be assessed as either in satisfactory or unsatisfactory condition for precise comparisons.

Implications of Study

The study was limited because it was an exploratory study which included only twenty-two school divisions in the Commonwealth of Virginia. The findings did not represent all school divisions in the state. Statistical analysis determined that there is a relationship between building expenditures and building conditions among school divisions classified as satisfactory and unsatisfactory. The findings do provide implications for practitioners.

1. The VEA measure of capacity and effort are based upon the components of the local composite index (LCI). Statistical analysis of the measure provides a strong method of measuring the financial ability of school divisions within the study.
2. When examining the budget expenditures of facilities and debt service it is noted that the amount of expenditures alone is not what determines statistical significance.
3. Fiscal capacity and fiscal effort are two financial concepts that must be understood in an effort to comprehend the financial state of schools within the Commonwealth of Virginia.

The school divisions within the study ranked differently each year within the five years of the study with regard to the VEA measure of fiscal capacity and fiscal effort.

Recommendation for Further Study

This study was unique because it explored the relationship of financial ability using two specific budget line items, facilities and debt service. The findings were statistically weak in some areas on an annual basis, but very robust when considering a five year expenditure of funds. Because of the findings in the areas of facilities and debt service, this would prove to be a profitable area to conduct research that would include conducting a statewide study to explore a wider population of school divisions using only the expenditure of debt service and building condition.

Another area of consideration for further study would consist of an examination of political decisions relative to financial matters and capital improvement of schools in the Commonwealth.

The following recommendations for further study are offered:

1. Conduct a statewide study that would explore the expenditure of the budget line items of facilities and debt service. This study will consist of every school division in the Commonwealth of Virginia. The purpose of this study would be to determine if there is a relationship between the expenditures of the two budget categories and building conditions statewide.

2. Conduct a study that would explore political decisions relative to financial decisions of public school authorities within the Commonwealth of Virginia to gain insight into the reasons behind the funding decisions that result in the condition of the school building.
3. A study should be mounted to explore the variables associated with the budget line item of maintenance and operation to determine its impact on building conditions.
4. Conduct a study that compares all school divisions that were rated according to building conditions.

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APPENDIX A

Expenditures for Selected Operating Budget Categories for School Divisions with
Unsatisfactory Buildings

(2000-2001)

School Division	Debt Service	Facilities	Total Expenditures	ADM
U1	6,148,437	1,696,383	7,844,820	10,704
U2	0	207,441	207,441	820
U3	6,187,674	10,628,470	16,816,144	10,595
U4	167,310	0	167,310	894
U5	611,210	9,559,612	10,170,822	4,053
U6	785,094	0	785,094	1,301
U7	428,261	706,523	1,134,784	2,635
U8	345,834	57,944	403,778	1,299
U9	1,504,456	4,551,963	6,056,419	2,770
U10	0	57,383,485	57,383,485	75,770
U11	751,228	192,998	944,226	2,027
TOTAL	16,929,504	84,984,819	101,914,323	112,868

APPENDIX B

Expenditures for Selected Operating Budget Categories for School Divisions with Unsatisfactory Buildings

(2001-2002)

School Division	Debt Service	Facilities	Total Expenditures	ADM
U1	5,781,147	45,130	5,826,277	10,720
U2	207,124	0	207,124	799
U3	6,697,949	8,528,129	15,226,078	10,581
U4	164,369	230,302	394,671	887
U5	382,122	4,080,211	4,462,333	3,817
U6	775,686	100,710	876,396	1,312
U7	418,178	0	418,178	2,640
U8	321,850	82,536	404,386	1278
U9	307,766	739,978	1,047,744	2,727
U10	0	48,704,290	48,704,290	75,090
U11	853,808	0	853,808	1,951
TOTAL	15,909,999	62,511,286	78,421,285	111,802

APPENDIX C.

Expenditures for Selected Operating Budget Categories for School Divisions with
Unsatisfactory Buildings

(2002-2003)

School Division	Debt Service	Facilities	Total Expenditures	ADM
U1	5,701,374	0	5,701,374	10,625
U2	0	0	0	788
U3	6,560,481	3,056,431	9,616,912	10,142
U4	161,428	236,573	398,001	911
U5	255,435	1,112,817	1,368,252	3,724
U6	770,746	0	770,746	1,350
U7	408,095	0	408,095	2,616
U8	619,003	560,661	1,179,664	1,319
U9	283,421	188,097	471,518	2720
U10	0	34,938,498	34,938,498	75,554
U11	730,205	438,644	1,168,849	1,925
TOTAL	15,490,188	40,531,721	56,021,909	111,674

APPENDIX D

Expenditures for Selected Operating Budget Categories for School Divisions with Unsatisfactory Buildings

(2003-2004)

School Division	Debt Service	Facilities	Total Expenditures	ADM
U1	5,566,149	1,156,448	6,722,597	10,680
U2	0	0	0	786
U3	6,281,011	1,006,414	7,287,425	9,836
U4	200,132	58,396	258,528	912
U5	232,249	196,750	428,999	3,621
U6	758,667	0	758,667	1,336
U7	398,013	0	398,013	2,583
U8	630,275	312,444	942,719	1,328
U9	670,876	27,200	698,076	2,672
U10	0	39,390,832	39,390,832	75,341
U11	732,978	684,051	1,417,029	1,920
TOTAL	15,470,350	42,832,535	58,302,885	111,015

APPENDIX E.

Expenditures for Selected Operating Budget Categories for School Divisions with
Unsatisfactory Buildings

(2004-2005)

School Division	Debt Service	Facilities	Total Expenditures	Total Enrollment
U1	5,445,083	7,450,048	12,895,131	10,880
U2	0	873	873	778
U3	6,057,077	1,175,263	7,232,340	10,083
U4	113,902	703,584	817,486	893
U5	226,264	778,274	1,004,538	3,499
U6	747,757	0	747,757	1,471
U7	387,931	0	387,931	2,520
U8	680,014	92,922	772,936	1,302
U9	628,549	1,813,014	2,441,563	2,633
U10	0	37,145,312	37,1445,312	74,656
U11	668,139	213,710	881,849	1,887
TOTAL	14,954,716	49,373,000	64,3237,716	110,602

APPENDIX F.

Expenditures for Selected Operating Budget Categories for School Divisions with Satisfactory Buildings

2000-2001

School Division	Debt Service	Facilities	Total Expenditures	Total Enrollment
S1	1,556,573	2,824,177	4,380,750	1,991
S2	7,304,106	4,426,145	11,730,251	10,567
S3	11,517,459	20,007,734	31,525,193	16,662
S4	4,347,455	1,404,859	5,752,314	4,893
S5	1,565,743	4,886	1,570,629	1,785
S6	32,228,099	135,846,971	168,075,070	31,604
S7	4,101,081	1,011,389	5,112,470	9,051
S8	167,024	5,902,190	6,069,214	2,041
S9	3,620,486	14,733,023	18,353,509	31,762
S10	10,689,803	7,718,307	18,408,110	35,077
S11	19,966,887	12,640,799	32,607,686	21,125
TOTAL	97,064,716	206,520,480	291,300,901	166,558

APPENDIX G.

Expenditures for Selected Operating Budget Categories for School Divisions with Satisfactory Buildings

(2001-2002)

School Division	Debt Service	Facilities	Total Expenditures	Total Enrollment
S1	1,334,024	404,928	1,738,952	1,992
S2	7,550,984	15,420,827	22,971,811	10,732
S3	12,866,266	19,316,737	32,183,003	17,184
S4	4,335,344	375,634	4,710,978	4,954
S5	1,543,021	77,800	1,620,821	1,759
S6	43,938,203	101,921,635	145,859,838	34,293
S7	3,999,052	1,088,421	5,087,473	8,953
S8	5,358	554,198	559,556	2,167
S9	15,549,076	14,687,933	30,237,009	31,592
S10	9,836,249	2,746,694	12,582,943	34,722
S11	19,063,435	21,626,026	40,689,461	22,346
TOTAL	120,021,012	178,220,833	298,241,845	170,694

APPENDIX H.

Expenditures for Selected Operating Budget Categories for School Divisions with Satisfactory Buildings

(2002-2003)

School Division	Debt Service	Facilities	Total Expenditures	Total Enrollment
S1	1,301,162	152,380	1,453,542	2,008
S2	9,755,273	27,822,742	37,578,015	10,962
S3	13,209,355	26,795,144	40,004,499	17,539
S4	4,376,928	228,417	4,605,345	4,981
S5	1,462,017	0	1,462,017	1894
S6	60,850,693	104,860,377	165,711,070	37,097
S7	527,977	925,827	1,453,804	8,843
S8	0	2,055,913	2,055,913	2,227
S9	15,827,455	14,022,227	31,303,486	31,382
S10	622,823	18,255,587	18,878,410	34,474
S11	19,884,486	9,560,184	29,444,670	23,698
TOTAL	127,818,169	204,678,798	333,950,771	173,105

APPENDIX I

Expenditures for Selected Operating Budget Categories for School Divisions with Satisfactory Buildings

(2003-2004)

School Division	Debt Service	Facilities	Total Expenditures	Total Enrollment
S1	1,428,404	543,086	1,971,490	2,033
S2	11,065,827	13,528,615	24,594,442	11,296
S3	13,850,285	11,123,542	24,973,827	17,917
S4	4,537,719	4,975,994	9,513,713	5,009
S5	2,187,822	0	2,187,822	1,859
S6	68,730,636	137,501,008	206,231,644	40,437
S7	1,068,674	844,745	1,913,419	8,665
S8	1,861,283	5,728,919	7,590,202	2,256
S9	17,496,503	4,952,986	22,449,489	30,704
S10	258,322	19,098,742	19,357,064	34,039
S11	19,544,092	35,729,294	55,273,386	24,643
TOTAL	142,029,567	234,026,931	376,056,498	178,858

APPENDIX J

Expenditures for Selected Operating Budget Categories for School Divisions with Satisfactory Buildings

(2004-2005)

School Division	Debt Service	Facilities	Total Expenditures	Total Enrollment
S1	1,283,963	572,234	1,856,197	2172
S2	12,407,904	15,253,128	27,661,032	11,718
S3	14,141,655	9,320,342	23,461,997	18,360
S4	4,983,878	17,425,106	22,408,984	5,102
S5	3,390,281	0	3,390,281	1,913
S6	175,926,178	98,769,570	274,695,748	44,350
S7	2,318,034	25,675	2,343,709	8,519
S8	1,893,492	5,789,487	7,682,979	2,343
S9	17,620,550	8,908,805	26,529,355	32,942
S10	249,682	10,194,847	10,444,529	35,541
S11	561,577	43,910,726	44,472,303	25,670
TOTAL	234,777,194	210,169,920	444,947,114	188,630

APPENDIX K

Example of the VEA Local Fiscal Capacity and Local Fiscal Effort (2000-2002). Based on the Local Composite Index - LCI

Examples – Local Fiscal Capacity and Local Fiscal Effort (2000-02)

(Based on the Local Composite Index- LCI)

Locality	<u>Fiscal Capacity</u>			<u>Fiscal Effort 2002</u>	
	LCI	Amount	Rank	Amount	Rank
	(1)	(2)	(3)	(4)	(5)
Powhatan County	0.4034	67,403	42	2.103	20
Warren County	0.3951	66,009	47	1.353	101

(1) LCI- The Local Composite Index is calculated for each school division to determine the state and local share of support for public education. The 32 step calculation uses the locality’s wealth components of True Property values, adjusted Gross Income, and Taxable Retail sales proportioned by population and the Average Daily Membership (ADM) as of March 31 in the school division related to the same components calculated for the State. The resulting index determines the ability of the locality to share in the cost of public education.

Powhatan and Warren Counties are similar in the components used to calculate the LCI. For every dollar required to be spent on the Standards of Quality, the LCI indicates that Powhatan and Warren can support approximately forty cents.

(2) Capacity- the capacity amount shown is simply the LCI converted to a dollar value. This conversion is necessary in order to determine effort.

(3) &(5) Rank- The ranking of the division in the state. Ranking is from high to low for 132 localities.

(4) Effort – Effort is the local amount of funding spent on public education related to the division’s capacity.

APPENDIX L

Example of the VEA Calculation of Fiscal Effort

<u>Calculation of Fiscal Effort</u>	Powhatan County	Warren County
1. Average Daily Membership (3/31ADM)	3,187	4,686
2. ADM weighted @ .6667	2,225	3,124
3. Total Population	21,000	29,000
4. Population weighted @ .333	6,993	9,657
5. Unit (line 2 + line 4)*	9,118	12,781
6. Total Local Expenditure	\$ 12,926,925	\$ 11,411,307
7. Expenditures per Unit (line 6 divided by line 5)	\$ 1,416	\$ 893
8. Local Fiscal Capacity	\$ 67,403	\$ 66,009
9. Local Fiscal Effort per \$100 of Local Fiscal Capacity (line 7 divided by line 8 times 100)	\$ 2,103	\$ 1,353

*Unit = 2/3's of ADM + 1/3 Population – the same proportion is used to calculate the LCI.

APPENDIX M

IRB Exempt Approval Letter



Office of Research Compliance
Carmen T. Green, IRB Administrator
2000 Kraft Drive, Suite 2000 (0497)
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540/231-4358 Fax 540/231-0959
e-mail ctgreen@vt.edu
www.irb.vt.edu
FWA00000572(expires 1/20/2010)
IRB # is IRB00000667

DATE: March 5, 2008

MEMORANDUM

TO: Glen Earthman
Thomas Whitley

FROM: Carmen Green 

SUBJECT: **IRB Exempt Approval:** "The Relationship Between Financial Ability and Building Conditions of High Schools in the Commonwealth of Virginia" , IRB # 08-119

I have reviewed your request to the IRB for exemption for the above referenced project. I concur that the research falls within the exempt status. Approval is granted effective as of March 5, 2008.

As an investigator of human subjects, your responsibilities include the following:

1. Report promptly proposed changes in previously approved human subject research activities to the IRB, including changes to your study forms, procedures and investigators, regardless of how minor. The proposed changes must not be initiated without IRB review and approval, except where necessary to eliminate apparent immediate hazards to the subjects.
2. Report promptly to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

cc: File