Summer 1991

A Study of the Planning Process Utilized by Urban School Divisions in Constructing Public Schools in the State of Virginia, 1984-1989

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A Dissertation Submitted to the Faculty of
Old Dominion University in Partial Fulfillment of the
Requirements for the degree of

DOCTOR OF PHILOSOPHY

URBAN SERVICES

OLD DOMINION UNIVERSITY

June, 1991

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ABSTRACT

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This research tested utilization of the "team approach" to planning for new school construction. Described in school plant planning literature as the most effective approach to planning new schools, the "team approach" is characterized by seven essential variables. To successfully plan a new school building, educators must:

1. involve more than one individual in collecting data;
2. provide quantitative data to the architect;
3. provide qualitative data to the architect;
4. provide data to the architect in advance of design;
5. provide data to the architect in written form;
6. provide original data, not prototype data; and
7. provide data which is used by the architect.

Collective use of all seven variables constitute the "team approach" to planning new school construction.

A group of ten urban school divisions which constructed new school buildings since 1984 was selected for review. The question under investigation was: Have urban school divisions which constructed satisfactory school buildings utilized the "team approach" to planning as described in research literature? In an effort to research use of the "team approach," the following questions were posed:

1. What is the degree of satisfaction urban school divisions have with newly constructed school buildings?

2. Which school buildings constructed by urban school divisions were perceived as the most satisfactory?

3. Which of the seven planning variables identified in research literature were used by urban school divisions which constructed buildings perceived as the most satisfactory?

4. Have urban school divisions which constructed buildings perceived as satisfactory used the "team approach" to planning as described in research literature?

Data was collected through personal interviews during on site visitations to each of ten selected schools. A personal interview was conducted with a central office administrator, the current building principal, two classroom teachers, the building custodian, and a PTA member of each identified school. Sixty personal interviews were conducted. The purpose of the interviews was to measure the degree of satisfaction urban school divisions have with new school buildings and to identify the process used by urban divisions when planning new school construction.

Three schools were identified as the most satisfactory and labeled exemplary buildings. Tanner's Creek Elementary School in Norfolk, Willow Springs Elementary School in Fairfax, and Nansemond River High School in Suffolk were perceived by individuals interviewed as the most satisfactory school buildings.

An examination of the planning variables used by the three divisions which constructed exemplary schools was made to determine if school divisions utilized the seven variables which constitute the "team approach" to planning. Only Norfolk utilized the "team approach" to planning as defined in school plant planning literature. Fairfax and Suffolk used six of the seven planning variables identified as the "team approach" to planning, however, in each case, Fairfax and Suffolk did not observe one of the seven planning variables. Both Fairfax and Suffolk failed to supply architects with original data for each new school, opting to use prototype data when simultaneously constructing more than one building.

This study shows that the three divisions constructing exemplary schools do involve more than a single individual when planning new school construction. Additionally, the study determines that the individuals planning each of the three exemplary buildings prepare and supply both quantitative and qualitative data to architects in written form in advance of building design. Also, the study shows that, in each case, information presented to architects has been used to produce building designs.

Furthermore, the study concludes that while research literature repeatedly endorses the use of original data for each new school project, educators who planned the construction of the three exemplary school buildings agree that the use of prototype data is both acceptable and advantageous.

Whoever undertakes to build a schoolhouse to meet and foster these ideals [furnishing the youth of our land nobler temples in which their hearts, minds, and bodies may better adjust themselves to the demands of a practical civic brotherhood] ought to approach his task with holy hands and a consciousness of the devotion which it is to typify.

Fletcher B. Dresslar, American Schoolhouses

ACKNOWLEDGEMENTS

It is with great humility and appreciation that I acknowledge the following individuals with my sincerest gratitude.

Mr. Marvin Powers, my best friend, husband, and companion of twenty years, who supported my dream of completing this project

Miss Amy Powers and Miss Angela Powers, our twin daughters, who, at fifteen years of age, have never seen a year when mom was not enrolled in school

Dr. Jack E. Robinson who chaired my committee with exceptional confidence and expertise, patiently guiding me through the most difficult challenge of my professional career

Dr. Maurice R. Berube whose phenomenal teaching and writings have served as an inspiration and whose unending support and encouragement have been unsurpassed

Dr. W. Randolph Nichols, Deputy Superintendent of Chesapeake Public Schools, Adjunct Professor of Old Dominion University and Norfolk State University, and personal friend; an individual who will always be a teacher of the highest order, one who instills in all who study under him a sincere desire to seek and share knowledge with fervent intensity

Mrs. Brenda McConnell, personal friend and secretary, who patiently and diligently confronted the world of Word Perfect to type every word of this research

Finally, this paper, a culmination of eighteen years of study at Old Dominion University, is dedicated to my mother, Annie M. Liverman and to my father, Charles F. Liverman, who, prior to his passing from this life, had a dream that his children would be formally educated.

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GLOSSARY

The following terms have been defined for purposes of this study:

Architect - professional hired to design the school building

Building modification - any significant alteration to the building to accommodate either students or the instructional program

Educational facilities planner - individual responsible for planning the construction of new schools

Educational program - the instructional, extracurricular, and athletic offerings in a school building

Educational specifications - a written description of quantitative and qualitative data presented to the architect prior to the design of the building

Exemplary school - those schools identified by interviewees as the most satisfactory

Functionally obsolete schools - buildings which require modification to accommodate students or the instructional program

Integrated planning process - a process where many individuals unite in a single effort to plan

Newly constructed - completed within the past seven years

Original data - quantitative and qualitative data collected exclusively for a particular school building

Planning variables - those aspects, procedures, or methods observed when planning

Prototype data - use of quantitative and qualitative data from a previous building design

Qualitative data - a description of building function; all of the activities which occur in a building

Quantitative data - the number of students, the number of courses, the number of teachers, etc. to be housed in a building

Role players - individuals involved in the planning effort

Team approach to planning - an effort to involve many diverse individuals in collecting data for the architect

Urban school divisions - those divisions listed as members of the Coalition of Virginia Urban School Divisions

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CHAPTER I

OVERVIEW OF THE STUDY

Introduction

For many decades educators throughout America have been severely criticized for producing poorly planned school facilities, buildings which have been described as inadequate, unsafe, and, in some instances, an obstacle to the learning process of children.[1] Descriptions of poorly planned school buildings have appeared in writing as early as 1860[2] and continue to appear in the literature today.[3] Even the most recently constructed schools have been labeled poorly planned structures, despite the fact that American educators have planned and built in excess of 88,000 school buildings.[4]

Although public school buildings in America represent a significant taxpayer investment, they have not been well planned.[5] Examples can be found in the most affluent localities as well as in the most financially depressed areas. Furthermore, they can be found in both urban and rural districts, despite the fact that urban educators have typically had more resources with which to plan and more experience in school plant construction.[6]

Educators charged with the responsibility of planning new schools have planned public buildings which fail to provide adequate space for the instructional programs of pupils. Additionally, they have planned buildings which do not sufficiently house the student population. Consequently, school buildings have

been planned which, prior to their opening, are functionally obsolete. A respected institution which reflects the dreams, concerns, and priorities of the society in which it was constructed, the public school building merits the ultimate in planning efforts on the part of educators who forecast the learning environments of pupils.

Background

The significance of effective planning for new school construction has been illustrated by Barnard, Dresslar, Caudill, Leu, Thrasher, Knezevich, Castaldi, MacKenzie, Boles, and Davis and Loveless.[7] Writers in the field of school plant planning such as those cited above have criticized the role of the educator in planning for new school construction and, have emphasized the need for educators to plan properly.

Directions for properly planning the construction of new school buildings have been found distributed throughout school plant literature. More specifically, seven variables essential for planning the construction of new schools have been identified. To successfully plan a new building, educators must:

1. involve more than one individual in collecting data;
2. provide quantitative data to the architect;
3. provide qualitative data to the architect;
4. provide data to the architect in advance of design;
5. provide data to the architect in written form;
6. provide original data, not prototype data; and
7. provide data which is used by the architect.[8]

While each individual variable represents a significant aspect of planning, a variable in isolation of the others will not produce a successful design. All seven variables operating collectively form a process called the "team approach" to planning which has been described as the most successful method of planning for new school construction.[9] Based on the premise that effective planning is both a product and

a process, the "team approach" to planning new schools involves more than one individual in a process of producing information for architects.

Educators utilizing the "team approach" when preparing for new school construction observe all seven variables. Specifically, educators collect and prepare data for use by architects. The data must be written; it must be original, not prototype; and it must be presented to the architect in advance of design.

Two types of data, quantitative and qualitative, must be presented.[10] Quantitative data defines the sizes and amounts of spaces needed. The number of courses, the number of teachers, the number of students, and the size of the school site are examples of quantitative data.

Qualitative data describes building function. When prepared properly, qualitative data, enables the architect to envision every detail of building activity before designing the facility. Without this description the building may require immediate modification to accommodate either the instructional program or to accommodate growth in student population. One author explains:

> In the past, architects faced some unusual problems when designing a school. They were expected not only to prepare technical specifications but also to decide what kind of educational program the building was to serve. Educators often neglected to describe the learning experiences offered. The architect was asked to design a building for a specific amount of money which would house a designated number of teachers and students. Beyond these meager instructions he was on his own to determine as best he could the nature of the educational program. The result was that teachers had to adjust their teaching to the building rather than having the building fit the program.[11]

Educators have a responsibility to provide both quantitative and qualitative information to architects. Unfortunately, according to Leu, Anderson and Van Dyke, and Davis and Loveless some schools have been designed without essential

qualitative information.[12] It takes many persons who are intimately familiar with the day to day operations of a school building to adequately prepare qualitative data. Hence, the most critical variables of the seven planning variables identified as the "team approach" to planning are (1) involving more than a single individual in the planning process and (2) providing qualitative data to the architect.

The 1987 construction of Dr. Phillips High School in Orange County, Florida is an example of a building planned by many individuals collecting qualitative data for architects. Specifically, in addition to school division employees, the building was planned in concert with eight of central Florida's leading high tech industries. The collaborative effort produced a building which was described by the Superintendent of Orange County Schools as aesthetically pleasant and very functional.[13] However, specific examples of such planning are rarely described in the literature and, as in this case, provide no statistics designating the school a satisfactory structure.

While experts in the field fail to cite specific examples of satisfactory school facilities, documentation is abundant in support of the "team approach" as the most effective method for constructing satisfactory schools. Defined by Caudill as a total planning concept, the "team approach" to planning requires that many individuals unite in a single effort to plan.[14] It is based upon a basic rule of inductive study that evidence must be gathered from more than a single observer. School plant planning and school construction can, according to this method, be more successful when approached by a team effort rather than by a single individual.[15]

Although soundly rooted in planning theory and supported in school plant planning literature, the concept of utilizing many perspectives to plan new school construction has yet to be tested. That is, no data has been found in the literature which documents that educators have constructed school buildings by using the "team approach" to planning. Furthermore, no data has been found which substantiates the concept that use of the "team approach" to planning produces a satisfactory school building.

Statement of the Problem

This research sought to determine whether the "team approach" was used in planning new school construction in a sample of urban school divisions. The problem under review was, "Have urban school divisions which constructed satisfactory school buildings utilized a 'team approach' to planning as described in research literature?" In an effort to research the problem and determine the relationship between planning variables and user satisfaction, the following questions were addressed:

1. What is the degree of satisfaction urban school divisions have with newly constructed school buildings?
2. Which school buildings constructed by urban school divisions were perceived as the most satisfactory?
3. Which of the seven planning variables identified in research literature were used by urban school divisions which constructed buildings perceived as the most satisfactory?
4. Have urban school divisions which constructed buildings perceived as satisfactory used the "team approach" to planning as described in research literature?

A methodology which included guided tours of the most recently constructed urban schools in the state of Virginia was developed to answer the

research questions. Urban school divisions which had planned and constructed new school buildings within the past seven years were identified. One school from each division was selected for review. A measure of satisfaction was taken for each sample school. Three of the sample schools were selected as the most satisfactory and labeled, exemplary. Planning variables utilized by urban school divisions which constructed exemplary schools were identified as well as the degree to which the "team approach" to planning was used. A comparison was made between the planning variables utilized by urban school divisions which constructed exemplary schools and those defined in the research as the "team approach." Details regarding this methodology can be found in Chapter Three.

Purpose and Significance of the Study

The concept of team planning appears in literature as early as 1911 and continues to appear in subsequent decades. It is praised by experts in the field as the best method of planning a satisfactory school building. The purpose of this study was to identify, describe, and test the "team approach" to planning the construction of new schools.

Since knowledge is now estimated to be doubling every two years,[18] newly constructed schools must be capable of providing for the rapid dissemination of knowledge to pupils. Adequate preparation must be given to proper and wise planning for each individual school facility, otherwise, the end product, the school physical plant, may well be functionally obsolete before it is occupied.

The problem described in this research is a concern to any school division faced with the dilemma of forecasting future instructional programs to be housed in educational facilities financed by taxpayers. Any effort made to identify and

document an appropriate and proven method of planning a successful school building will supplement and enrich the existing literature on school facilities planning.

1. Henry Barnard, School Architecture: or Contributions to the Improvement of School-Houses in the United States (New York: A. S. Barnes, 1860), 15-16.

2. Ibid.

3. Wolves at the Schoolhouse Door (Washington, D. C.: The Education Writers Association, 1989), 4.

4. Ibid., 9.

5. Barnard, 5-7; Carl H. Stautz, Planning Your School Building Dollar (New York: Chilton Company, 1960), 39-40; James M. Thrasher, Effective Planning for Better School Buildings (Midland, Michigan: Pendell Publishing Co., 1973), 2; Stephen J. Knezevich, Administration of Public Education (New York: Harper and Row, 1975), 564; and Donald J. Leu, Planning Educational Facilities (New York: Center for Applied Research, 1965), 40.

6. Wolves at the Schoolhouse Door, 35.

7. Barnard, 50-51; Fletcher B. Dresslar, American Schoolhouses (Washington Government Printing Office, 1911), 100-105; William W. Caudill, Toward Better School Design (New York: F. W. Dodge Corporation, 1954), 186; Leu, 33; Thrasher, 2-5; Knezevich, 563; Basil Castaldi, Educational Facilities Planning, Modernization, and Management, Third Edition (Boston: Allyn and Bacon, 1987), 142-143; Donald G. MacKenzie, Planning Educational Facilities (New York: University Press of America, 1989), 7; Harold Boles, Step by Step to Better School Facilities (New York: Holt, Rinehart, and Winston, Inc., 1965), 246; and Jack Davis and E. E. Loveless, The Administrator and Educational Facilities (New York: University Press of America, 1981), 1-5.

8. Caudill, 186-198; Castaldi, 144-147; Knezevich, 563-569; Davis and Loveless, 5-9, 28, 33, 39; Boles 65-69; Wallace H. Strevell and Avid J. Burke, Administration of the School Building Program (New York: McGraw-Hill Book Company, 1959), 264, 288; Leu, 33; Guide for Planning Educational Facilities (Columbus: The Council of Educational Facilities Planners, 1971), 17-18; and Lester W. Anderson and Lauren A. Van Dyke, Secondary School Administrative (New York: Houghton Mifflin Company, 1972), 496.

9. Caudill, 187, 198.

10. Boles, 66-69.

11. Anderson and Van Dyke, 496.

12. Leu, 37; Anderson and Van Dyke, 496; and Davis and Loveless, 26, 39.

13. Ellen Ficklen, "This High-Tech High School Brings the 21st Century to Orlando A Little Early," The American School Board Journal (April, 1988): 36.

14. Caudill, 187.

15. Ibid.

16. Raymond E. Babineau, "Projecting Educational Programs and Planning Educational Facilities," CEFPI's Educational Facility Planner 27, (January-February 1989): 26.

CHAPTER II

THEORETICAL FRAMEWORK

The purpose of this chapter is to present a review of school plant planning literature. After a brief introduction where planning has been defined, the review focuses specifically on proper planning for new school construction.

The review examines frequent criticisms of school facilities planning, defines a satisfactory school building, and explains the role of the educator in planning the construction of a satisfactory school. Furthermore, the review illustrates the significance of the "team approach" to planning new schools in the form of a model.

Introduction

The success of any organization is contingent, in part, upon its ability to plan and direct the pursuit of human growth. The significance of planning is illustrated in the Promethean view that man guides his own growth and therefore, is responsible for planning his own planning.[1] Not only is planning considered a product resulting from the application of the scientific method, however crudely applied, but planning is also considered a process which leads to a product.

Tanner and Williams believe that, "how well an organization functions depends on its ability to facilitate planning, to foresee events, to utilize current knowledge and methods to solve problems, and to control and accommodate forces

within and without its boundaries."[2] Effective planning involves the generation, evaluation, and selection of alternatives which will identify the most productive means of attaining a goal. Effective planning for new school construction involves educators generating, evaluating, and selecting information to present to building architects, information which will produce satisfactory school buildings.

Educators have been severely criticized for a lack of appropriate planning when constructing new public school buildings. Throughout the literature of school facilities planning, from the early 1800's to the present day, critics have described American schoolhouses as inadequately planned structures. In response to these criticisms, William W. Caudill and others have endorsed a "team approach" to planning the construction of new schools. Caudill's illustration of the "team approach," in the form of a model, a model which ensures a properly planned school building, provides a theoretical framework for this study.

Criticism of School Facilities Planning

For many years, critics have recognized schoolhouses as poorly planned facilities. One of the first written documents of such criticism appeared in 1833 when the Essex County Teachers' Association published a report described as, ". . . a searching and vigorous exposure of the evils resulting from the defective construction and arrangement of school-houses."[3]

Excerpts from official school documents of the mid 1800's describe American schools as badly located, exposed to noise, dust and dangers of the highway, unattractive and in some instances repulsive in appearance.[4] School buildings were too small, badly lighted, improperly ventilated, imperfectly warmed, and inadequately furnished. One particular building, a one room structure

measuring nineteen and one half feet square, had an enrollment of 80 pupils.[5] Making frequent comparisons of the schoolhouse to the home of savages, it is interesting to note that educators of this era were angry with the conditions of their schools. According to one observation, "many of our schoolhouses are in a miserable condition, possessing less attractions outwardly than our prisons."[6]

A century later, American schoolhouses were described by John Goodlad as, "anything but the 'palaces' of an affluent society ... they look like the artifacts of a society that expressed its disregard by creating schools less suited to human habitation than its prisons."[7] Experts in the field of school plant planning have cited examples of buildings which fail to house the student population, which fail to accommodate the instructional program, and which fail to provide a safe and inviting learning environment for pupils. Even the most recent literature of school plant planning is critical of school buildings. A 1989 report investigating the condition of public schools referred to the American schoolhouse as a visible sign of child neglect, stating that, "25% of the nation's schools are shoddy places for learning, lacking sufficient space, safety, and maintenance for the students and teachers in them."[8]

Unfortunately, the criticism which spans many decades, is consistently the same. Both the one-room schoolhouse of early America and the state-of-the-art facility of the present day have been given identical reviews. Public school buildings have been poorly planned.

A specific example of poor planning relates to the fundamental need of students to hear the instruction of the teacher, a need which must be considered

before appropriate space for learning can be designed. A reference in 1849 reports that schoolhouses were located on the highway,

> ... many within a few feet of the traveled path, with windows looking directly upon it, so that the attention of the scholar is necessarily attracted to every passer-by, thus diverting his attention from his studies, retarding his progress, and annoying his teacher.[9]

More than a hundred years later an inspection of school buildings across the United States found schools to be surprisingly noisy, surmising that noise was perhaps the most common fault of new school buildings.[10] A similar complaint, noise in the building, comes from a most recently constructed school building, Christa McAuliffe Elementary School. The building has been described as follows:

> An architect's dream, the $8 million Christa McAuliffe Elementary School in Montgomery County, Maryland is designed like a quaint shopping mall, with multi-purpose areas arranged as large stores, and classrooms as little boutiques. Atrium-styled skylights bathe the school with brightness, but some adjustments may be in order. Direct sunlight makes the hallways excessively warm in good weather, and the high ceilings trap noise, as in an echo chamber.[11]

Obviously any condition which hinders the ability to hear instruction inhibits the learning of pupils. One medical doctor observed,

> 'The fact that school children cannot concentrate so well under the influence of noise has a profound effect on their work. It often means that whole hours of the day are completely wasted, because if we do not concentrate well, we cannot remember - only those ideas on which we have trained the full searchlight of our conscious mind become clearly recorded in our memory.'[12]

A school building which adversely affects student learning in this manner is not satisfactory. Such a facility has failed to meet the expectations for which it was designed, and, therefore, is labeled a poorly planned school building.

Other examples of poor planning for new school construction focus on overcrowded facilities and undesirable physical plant features. School buildings

which fail to provide space for course offerings and extracurricular activities are poorly planned. School buildings which fail to provide adequate lighting or which fail to provide a comfortable learning environment are poorly planned. Furthermore, school buildings which, under any circumstance, are unsafe for pupils are poorly planned.

The Role of The Educator in the Planning Process

Planning a Satisfactory School Building

Leu has said that, "parents, teachers, and other citizens of the community generally agree that the primary purpose of the school building is to house the educational program."[13] The purpose of a school building, therefore, is to provide appropriate space for teaching and learning. When constructing new schools, educators have a responsibility to plan and produce buildings which will house all programs and activities satisfactorily.

In defining a satisfactory school, Caudill determined in 1954 that good school structures must:

1. facilitate to the greatest possible degree the educational methods and the curriculum by which that process is controlled,
2. provide an environment of maximum desirability for pupils and teachers engaged in the learning process,
3. achieve both these ends harmoniously within the limitations of the community budget.[14]

Three decades later, Castaldi expressed the same philosophy. A good school structure must be adequate, efficient, and economical.[15]

Described as the largest piece of instructional equipment which influences the teaching-learning process,[16] the satisfactory school building must meet the following requirements:

1. A school building must be functional. It must be operational, performing the job for which it was intended.[17]

2. A good school building should be tailored for the educational function of the school."[18]

3. Adequacy of a school building is determined by the number, size, shape, and quality of educational spaces.[19] The size of an instructional space directly influences its proper functioning.[20] The shape of an instructional space should be suited to the function it is designed to serve.[21]

4. A school building should be designed so that it functions as a single organism.[22]

5. A good school building considers the arrangement and location of facilities in relation to the total school.[23]

6. A good school building does not impede learning.[24]

7. A good school building allows no interference with building functions.[25]

8. A good school building does not inhibit learning.[26]

The satisfactory school has been described in detail by the Council for Educational Facilities Planners and by Basil Castaldi. According to Castaldi, a satisfactory school building meets the quantitative and qualitative requirements of the educational program. That is, it accommodates all pupils and all activities without modifying either the building or the program to do so. The satisfactory school contains an adequate number of instructional spaces of appropriate size and shape to house all pupils. It contains comfortable thermal, acoustical, and visual conditions for students and teachers. Additionally, the satisfactory school building

provides a suitable atmosphere where color, lighting, shape, and proportions are coordinated effectively.[27]

The satisfactory school building creates a proper relationship between spaces where the facility functions as a single unit and all activities can be conducted efficiently, conveniently, and economically. Additionally, the satisfactory school plant is one where conditions do not, in any way, hinder the learning of pupils or inhibit the instructional process.

Producing Educational Specifications

When planning the construction of a new school, educators have a responsibility to ensure that the building is planned properly and that the new facility is a satisfactory one. Educators have traditionally perceived the responsibility as a job solely for the architect. Planning for construction has been seen as an assignment for a hired specialist. A meager amount of quantitative data such as the number of pupils to be housed, grade levels involved, and teachers to be employed was all that was supplied by the educator. The architect, although not a teacher, was placed in the position of designing the instructional space of pupils. McQuade observed that, "for decades, school buildings had little more planning than some brief instructions given to the architect by the superintendent. This procedure is obviously completely inadequate."[28] Other experts explain that, routinely,

> The architect was asked to design a building for a specific amount of money which would house a designated number of teachers and students. Beyond these meager instructions he was on his own to determine as best he could the nature of the educational program. The result was that teachers had to adjust their teaching to the building rather than having the building fit the program.[29]

According to one writer, the process was a waste of the taxpayers' money. There are inadequate school buildings and school plants all over the country which offer mute evidence of educators who failed to supply architects with an adequate description of the activities which occur in a school building.[30]

A properly planned school building is the responsibility of both the architect and the educator. A clear distinction between their responsibilities has been established by writers in the field of school plant planning. The educator describes the use of the building and the architect uses that description to sketch the design. The educator, therefore, describes the function, and the architect determines the form. It is vital that the responsibility of the educator precede that of the architect.[31]

Specifically, architects require a complete and accurate description of all building activities, commonly referred to as educational specifications, before a successful design can be produced. Such specifications clearly and concisely describe the various learning and extracurricular activities to be housed in the school, their spatial requirements, and special features. Properly planned, these specifications enable the architect to clearly imagine every detail of educational activity to be conducted in a proposed educational facility.

Educational specifications, according to research literature, have several component parts: a written description of building function, a representation of a multitude of perspectives, and a presentation to and for use by the architect in advance of building design.[32] Each set of specifications must be original.[33] An original set guarantees that the specifications are tailored for the building destined to house the program the educator has described.[34] A complete description

includes two types of information, quantitative and qualitative data.[35] While quantitative data defines the sizes and amounts of spaces needed, qualitative data describes the programs and activities which will occur in the facility. When this quantitative and qualitative information is presented to the architect in writing[36] prior to building design, the architect is in a position to envision the form of the building; the shape that is needed to house the pupils and their activities.

Unfortunately some schools have been designed without essential qualitative data. Such designs have not been satisfactory. Educators who fail to provide qualitative data to architects produce buildings which are not designed for a specific instructional program. For example, art instruction requires natural light; computer labs require static free environments; and band and chorus rooms require acoustical treatment. Band rooms should not be located in the center of an academic wing. Educators who fail to provide such ample and appropriate data to architects produce buildings which are perceived as functionally obsolete prior to opening.

The educator has a responsibility to prepare educational specifications for the architect.[37] Successful building function is contingent upon such detailed planning. School plant experts agree that, "function does not just occur; it must be planned."[38] Benjamin C. Willis succinctly stated the need for educators to prepare educational specifications when planning the construction of new schools in a report to the Chicago Board of Education thirty years ago. He remarked,

> The architect needs much more than the obvious information such as the size and the location of the site, the budget appropriation, and the number of children for whom he is to provide rooms. It is also necessary that the architect know the kind of learning experiences in which they will engage.[39]

Utilizing the "Team Approach"

Leu felt that, "many an architect has been criticized for his building when the basic fault lies in the low quality of educational planning preceding his work."[40] Although educators have typically supplied architects with the number of students to be housed, the number of teachers to be employed, and other such quantitative statistics, educators have been criticized for failing to provide essential qualitative data, a written description of building function.

Numerous functions must be described so that architects understand the daily operation of the school. For example, activities in a science laboratory differ from those in an English class. The function of a computer laboratory is different from that of a home economics suite. Students in special education courses require unique features such as changing tables and toileting facilities which must be described to the building architect. It is the educator, not the architect, who has an obligation to provide functional planning, the writing of educational specifications which include adequate and appropriate quantitative as well as qualitative information. It is essential that architects determine the form of the building after they know and understand the functions of the building.

The most effective way for an educator to prepare educational specifications for the architect is to collect descriptions of building function from a variety of perspectives. As one author commented, "an outstanding educational facility is the result of an effective team effort, the product of carefully planned, coordinated activity of the planner, educator, designer, builder, and user."[41] It takes many people who are intimately familiar with the daily operation of a building to describe it.

Planning a successful building is a combined effort. According to McQuade, "Any building is at heart a collaboration between the architect and the client--but especially a school building. . . . The client in this case is plural . . . the people of the school district."[42]

The team approach to planning appears in the literature as early as 1911 when Dresslar urged school board officials to give members of their teaching force a large share in planning their schoolhouses.[43] He thought it absurd that persons without an intimate acquaintance of the demands and necessities of a schoolhouse were those selected to plan it. The most essential characteristic of school plant planning is wide democratic involvement.[44] Caudill, Knezevich, Castaldi, Strevell and Burke, Davis and Loveless and Day have printed a similar philosophy in subsequent decades.[45]

While endorsed by many writers over a series of decades, the team approach to planning was presented in the form of a model in 1954 by William W. Caudill, a professional architect and author who has been referred to as a prophet.[46] He has been known by his colleagues as a true visionary in the architectural world. Upon establishing an architectural firm in the 1940's, Caudill was constantly in search of improving the field of design and its practice. He has been credited with the pursuit and nurturance of a team approach to problem solving. To Caudill, a team is not the same thing as a committee, "a number of people polling their opinions and voting their prejudices. Rather, a team is composed of, 'A group of specialists solving problems in an atmosphere where the opinions of each are respected, but the highest value is placed on the opinions of a specialist within his specialty.'"[47]

Initially a controversial concept, the team approach was criticized by other architects who felt that bringing clients into an architect's domain would stifle creativity. Caudill's architectural firm built a national organization with home offices in Houston, New York, and Los Angeles. Pioneering aspects of on-site building design, this organization was noted for its "squatters teams," groups who visited in the client's environment, to program and design at the scene of the action.

The art of collaboration came very early for Caudill who, at the age of 26, published a book, "Space for Teaching." The book was recognized in 1952 by the Royal Institute of British Architects as the most generally useful school design studies in existence. Leading U. S. educators, including Walter D. Cocking, considered it one of the strongest forces to revolutionize schoolhouses in America.[48]

Caudill dreamed of designing schools and landed his first school construction job in Blackwell, Oklahoma in 1948.[49] Utilizing the team approach to design, he and his staff met in the school board room for a week designing the school with educators. The school was made famous by a story written in Collier's Magazine by Walter McQuade who later became an editor of Fortune.[50]

Highly acclaimed for the design of schools, colleges, municipal buildings, sports arenas, convention centers, and an underground system for pedestrian circulation, Caudill is most noted for his squatters method of design, where all possible role players form a team and make decisions prior to design and construction. After several decades of experience in school construction, Caudill observed, "Throughout the years of our practice, we have learned that client/users' involvement generally assures better facilities."[51]

Caudill has been honored by American School and University's Architectural Portfolio, the nation's only tribute to design excellence.[52] Architectural Portfolio presents an annual award recognizing superior school design in the name of Caudill, the William W. Caudill Citation Award.

Caudill's Model

No two school building problems are alike and, therefore, each building must be tailored to its own time, its own geographic section, its own specific location and its own specific functions for its own users. The tailoring is more complex than at first might seem apparent.

Believing that no man is able to study the planning problem from all pertinent points, William W. Caudill proposes a panoramic perspective, involving many observers, members of a building committee, finance committee, site selection committee, superintendent, teacher, custodian, architect, and students. Each perspective is limited, supplying only a partial perspective to the total planning process, however, it is vital that many separate but limited perspectives coalesce into one total planning concept. Based upon a basic rule of inductive study that evidence must be gathered from more than a single observer, logically totally acceptable schools can result only from this total planning concept.[53]

Caudill's planning process involves many people with different interests. To illustrate the significance of their combined perspectives, he created a spoke-wheel chart. (See Figure 1.)

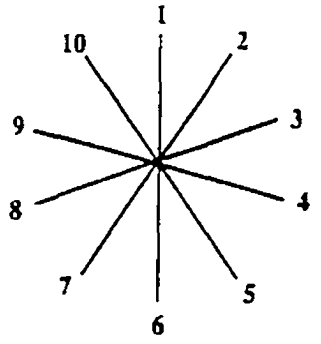


Fig. 1. Spoke Wheel Chart

He identified seven role players, referred to as planners, as examples of individuals who should be involved in the planning process for new school construction and assigned each one to a spoke wheel chart, making seven wheels. The seven planners he identified were citizen, administrator, teacher, custodian, consultant, engineer, and architect. He then identified ten major considerations of planning the school plant. According to Caudill, persons involved in planning new school construction should have some knowledge of these ten considerations:

1. Basic needs of pupil
2. Structure and material
3. Community needs
4. Construction costs
5. Learning methods
6. Environment
7. School administration
8. Public relations
9. Architectural aesthetics
10. Maintenance

Each one of the ten major considerations was assigned a spoke on each spoke wheel. Caudill examined each planner's profile and determined his ability to contribute to the planning process according to the amount of knowledge each had in regards to the ten major considerations of planning a school plant. Upon determining the planner's ability to contribute to the process, Caudill arbitrarily assigned placement on the spoke wheel chart for each one of the ten major considerations of planing for a school plant. (See Figure 2 below.)

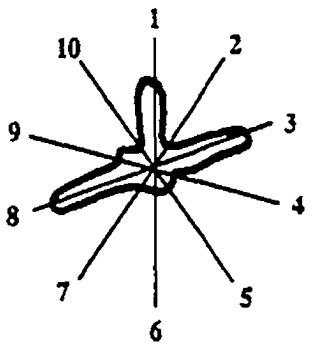


Fig. 2. Role of the Citizen

For example, the profile for a citizen indicated that a knowledge of basic needs of a pupil ranked very high, but since he probably knew very little about structure and materials, he would have a fairly low rating for the second consideration, structure and materials. Because of his civic work, he had considerable knowledge about the third consideration pertaining to community needs. Because he is neither an architect nor an educator, his score for the next four considerations are very low. Since he is involved in civic activities, he is in an excellent position to know the "pulse" of the community. So, he received a very good score for number eight, public relations. And because he knows very little about architecture, aesthetics,

and maintenance, his score for the last two items would be low. So, the profile of this particular citizen would look something like the diagram in Figure 1.

Individually, each profile proves little more than a capricious assignment of numbers to a chart, however, Caudill took each of the seven spoke-wheel profiles and combined them into one composite drawing. See Figure 3.

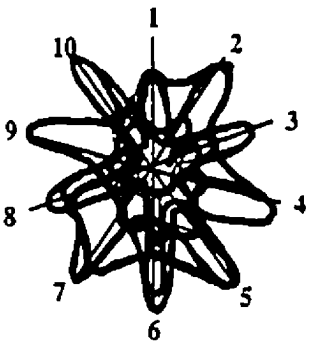


Fig. 3. Composite

While no one planner's profile forms a perfect circle, reaching the outer limits of diagram, the composite drawing of all seven approaches the ideal. Regardless of how competent an individual is, he cannot see the planning process from all perspectives. A total perspective requires many observers. The composite curve of the combined profiles never reaches the ideal, but it gets near enough to it to make the democratic process of planning worthwhile.

Although this chart is an illustration of Caudill's theory, it by no means exhausts the list of role players he feels should contribute in the planning of new schools. Caudill's literature also cites school board members, engineers, students and others as worthy participants of the planning process. Furthermore, advice is given to educators throughout school plant literature regarding the composition and

selection of committee members. While many authors provide a specific list, with few exceptions, the lists are similar, involving as many perspectives as possible. Teachers, custodians, supervisors--the whole school staff should become involved in the work. They can define the kinds of activity which will express the accepted educational philosophy. This cannot be done once for all school districts. It must be done for each individual school.[54] Englehardt recommends citizens, school staff, school board, superintendent, teachers, principals, directors of special areas, state officials, architects, and educational consultants.[55] The Council for Educational Facilities Planners prepared this statement in regards to who should plan schools:

> And what about the involvement of people in planning? Students, custodians, staff,and specialists must be actively involved in planning facilities. All the answers are not necessarily held by a select group of wise administrators; therefore, broad representation in the planning process helps in the development of effective facilities with a long, useful life. Involvement of people has many problems and does require a great deal of time. But time is also the true measure of a building. The involvement of people in planning will help assure a building that will pass the test of time.[56]

All persons involved in the use of the school plant can provide valuable information regarding plant activity. The school administrator can improve the effectiveness of the product by involving as many individuals in the planning process as possible. As the New England School Development Council has stated,

> very few architects claim to be expert in solving the educational problems as they apply to the planning of a school building. The educational authorities must first determine their own policies and be able to present to the school architect a clear statement of their building needs.[57]

State education agencies have endorsed the concept of involving many perspectives in the planning process. A majority of states have a section, division,

or department that is responsible for the planning, design, and/or operation and management of educational facilities.[58] These divisions have provided local school boards with suggested procedures for planning the construction of new schools, including involvement from a team of individuals.

The state of Maryland, for example, provides a format to assist school systems and their planning committees as they prepare educational specifications for specific projects.[59] The writing of educational specifications by a local school system is a state requirement in Maryland, one which provides assurance that local educational decisions are presented to design professionals before sketches are made. Additionally, the state of Maryland provides a list of suggested participants to be included in the planning process.

For many decades, writers have implored educators to solicit many perspectives when planning for new school construction. One writer explained, "the team approach to the planning venture is an absolute must if the patrons are to really get their money's worth in the new school facilities."[60] Sometimes, however, the "team" has been composed of a top administrator of the school system and its architect. Admittedly that kind of team represents a great improvement over the practice of turning all planning over to the architect, but it is still inadequate for the planning of infinitely complex educational programs and practices. As Dresslar stated,

> Again and again I have seen boards of education come together to consider plans which had been placed in competition without so much as inviting a principal or superintendent to aid them. . . In every school system, whether a regularly employed architect is available or not, the superintendent of schools ought to insist that a committee from the teaching staff should with him be empowered by the board to study plans and advise architects on all matters pertaining to arrangements most suitable for practical school work. This committee ought to be a

> standing committee, and should be in every way encouraged to study in detail schoolhouses from the educational point of view. It is certainly very poor economy to neglect to utilize the teachers' intimate knowledge of what is needed.[61]

There are advantages to consulting many opinions when planning a school. A superintendent will capitalize on the strengths of committee members and use the committee to serve as a liaison group between educators and the general public, to field test ideas for the new school, to communicate the ideas to the public and provide feedback, to solicit a multitude of ideas on what the public desires of their schoolhouse, and to solicit the support for new and innovative programs and special features in the school. He can use the committee to communicate to the public a clearer and deeper understanding of the educational purpose of the new building. In the process of defining the needs for the facility, the superintendent will earn the support of the committee, he will have become cognizant of the agreements and harmonies of conflicting interests, and he will have proposed a school building that is representative of the mores and values of his constituents. There is no better way of anticipating the possible effects of various decisions than to test each of them before groups with conflicting values and viewpoints.[62]

Summary

The purpose of a schoolhouse is to provide an appropriate and functional environment for educating youth. An inappropriate or functionless environment inhibits the educational process. The planning concept of William W. Caudill and other experts in the field of school plants proposes that use of the "team approach" to planning new school construction ensures a more functional facility, a

satisfactory school building. Based on a review of school plant planning literature and specifically the opinions of experts in the field the following statements have been designed to measure satisfaction with a newly constructed school.

1. The building meets the expectations for which it was designed.
2. The building has an adequate number of spaces to house the entire student population.
3. The building has an adequate number of spaces to accommodate the instructional program.
4. Each space of the building is of sufficient size and shape.
5. The building has adequate space for the extracurricular, athletic, and social activities of pupils.
6. The building operates as a unit with all parts located in a proper relationship so that activities can be conducted efficiently, conveniently, and safely.
7. The building provides a safe and comfortable learning environment for pupils.
8. The building needs no modification.
9. The building does not, in any way, inhibit the instructional program.
10. The building does not, in any way, adversely affect the learning of pupils.

Planners of schools, according to William W. Caudill, generally have planned with only partial evidence, failing to provide ample data to architects and failing to gather such data from more than a single observer. Consequently, educators have failed to produce satisfactory school buildings. For a complete understanding of the specific problems in planning any one school, it is necessary to utilize the variables which constitute the "team approach." It is, therefore, necessary to:

1. involve more than one individual in the collection of data,
2. provide quantitative data to the architect,

3. provide qualitative data to the architect,
4. provide data to the architect in advance of design,
5. provide data to the architect in written form,
6. provide original data not prototype data, and
7. provide data which is used by the architect.

To test the "team approach" as a method for planning satisfactory school buildings, this research examines the problem, "Have urban school division which constructed satisfactory school buildings utilized a 'team approach' to planning as described in research literature?" Specifically, this research examines the following questions:

1. What is the degree of satisfaction urban school divisions have with newly constructed school buildings?

2. Which school buildings constructed by urban school divisions were perceived as the most satisfactory?

3. Which of the seven planning variables identified in research literature were used by urban school divisions which constructed buildings perceived as the most satisfactory?

4. Have urban school divisions which constructed buildings perceived as satisfactory used the "team approach" to planning as described in research literature?

Chapter Three presents the procedure used to test the "team approach" as a method for planning the construction of satisfactory schools.

1. Andreas Faludi, Planning Theory (New York: Pergamon Press, 1973), 52.

2. C. Kenneth Tanner and Earl J. Williams, Educational Planning and Decisionmaking (Lexington: D. C. Heath and Co., 1981), 3.

3. Henry Barnard, School Architecture: or Contributions to the Improvement of Schoolhouses in the United States (New York: A. S. Barnes, 1860), 5-6.

4. Ibid., 15-16.

5. Ibid., 17.

6. Ibid., 19.

7. Philip R. Piccigallo, "Renovating Urban Schools is Fundamental to Improving Them," Phi Delta Kappan (January 1989): 402-403.

8. Wolves at the Schoolhouse Door (Washington, D.C.: The Education Writer's Association, 1989), 1.

9. Barnard, 23.

10. Walter McQuade, ed, Schoolhouse (New York: Simon and Schuster, 1958), 135.

11. Wolves at the Schoolhouse Door, 10.

12. McQuade, citing Dr. Foster Kennedy, 136.

13. Donald J. Leu, Planning Educational Facilities (New York: The Center for Applied Research in Education, Inc., 1965), 42.

14. William W. Caudill, Toward Better School Design (New York: F. W. Dodge Corp., 1954), 18.

15. Basil Castaldi, Educational Facilities Planning, Modernization and Management, Third Edition (Boston: Allyn and Bacon, 1987), 176-183.

16. Jack Davis and E. E. Loveless, The Administrator and Educational Facilities (New York: University Press of America, 1981), 3.

17. Harold Boles, Step by Step to Better School Facilities (New York: Holt, Rinehart, and Winston, Inc., 1965), 241.

18. Castaldi, 180.

19. Ibid., 176.

20. Ibid., 177.

21. Ibid., 178.

22. Ibid.

23. Guide for Educational Facilities Planning, (Columbus: The Council of Educational Facilities Planners, 1971): 194.

24. McQuade, 20.

25. Boles, 243; and Richard Niece, "The Impact of Environment on Teaching and Learning," NASSP Bulletin (May, 1988): 80.

26. Niece, 80.

27. Castaldi, 176-179.

28. McQuade, 17.

29. Lester W. Anderson and Lauren A. Van Dyke, Secondary School Administration (New York: Houghton Mifflin Co., 1972), 496.

30. Carl H. Stautz, Planning Your School Building Dollar (New York: Chilton Company, 1960), 39-40.

31. Kristen Affleck and Brian Fuller, "The Integration of Programming and Educational Specifications," CEFP Journal (November-December 1988): 9.

32. Davis and Loveless, 28-34; and C. William Day, "State-of-the Art Facility: A Planning Process." Paper presented at the Annual Meeting of the Association of School Business Officials (September 29 - October 3, 1985), 9, ERIC, ED276096.

33. Castaldi, 198; and Boles, 66.

34. Ibid.

35. Boles, 67-69.

36. Ibid., 65.

37. Wallace H. Strevell and Avid J. Burke, Administration of the School Building Program (New York: McGraw-Hill Book Company, 1959), 261-262.

38. Ibid., 249.

39. Benjamin C. Willis, We Build, A Progress Report. Annual Report of the Chicago Board of Education (Chicago, Illinois: Board of Education, 1958), 4-7. quoted in Leu, 33.

40. Leu, 40.

41. Guide for Planning Educational Facilities, 18.

42. McQuade, 15.

43. Fletcher B. Dresslar, American Schoolhouses (Washington Government Printing Office, 1911), 105.

44. McQuade, 49.

45. William W. Caudill, Toward Better School Design (New York: F. W. Dodge Corporation, 1954), 186-198; Stephen J. Knezevich, Administration of Public Education (New York: Harper and Row, 1975), 569; Basil Castaldi, Educational Facilities Planning, Modernization, and Management, Third Edition (Boston: Allyn and Bacon, 1987), 147; Strevell and Burke, 288; Davis and Loveless, 5-9; and C. William Day, "State-of-the-Art Facility: A Planning Process." Paper presented at the annual meeting of the Association of School Business Officials, 9 September 29-October 3, 1985, ERIC, ED276096.

46. William Wayne Caudill, Architecture by Team (New York: Van Nostrand Reinhold Co., 1971), v.

47. Ibid., v, vi.

48. Ibid., 11.

49. Ibid., 10.

50. Ibid., 250.

51. Ibid., 312.

52. American School and University Architectural Portfolio (November 1990): front cover.

53. Caudill, Toward Better School Design, 187.

54. Strevell and Burke, 271 citing Lawrence B. Perkins and Walter D. Cocking, Schools (New York: Reinhold Publishing Corporation, 1949), 62.

55. Nickolaus Englehardt, Complete Guide for Planning New Schools (New York: Parker Publishing Co., 1970), 29.

56. "What Went Wrong," Maintenance and Operation Errors to Avoid in Educational Facility Planning (Columbus: Council of Educational Facility Planners, 1968), 129-131.

57. Strevell and Burke, 264 citing Conducting a School Building Program (New England School Development Council, Cambridge, Mass., 1947), 4.

58. Yale Stenzler, "State Education Agencies: Planning Requirements," Educational Facility Planner (May-June 1989): 7.

59. Maryland School Science Facilities Guidelines. A publication of the Division of Instruction, Maryland State Department of Education and The Education Section (Maryland Interagency Committee on School Construction, 1977), 1-2.

60. James M. Thrasher, Effective Planning for Better School Buildings (Midland, Michigan: Pendell Publishing Co., 1973), 5.

61. Dresslar, 105.

62. Strevell and Burke, 22.

CHAPTER III

PROCEDURE AND METHODOLOGY

This chapter describes the procedures and methodology of the study. Specifically, the method of data collection and sample selection have been discussed. Furthermore, a detailed explanation of the procedures observed in the study have been included.

Method of Data Collection

Twenty-two public schools have been designed and constructed in the state of Virginia by urban school divisions since 1984.[1] Distributed throughout the state in ten different localities, the twenty-two buildings represent an investment of over 143 million dollars.[2] While school divisions such as Richmond and Norfolk have completed only one school each in the past seven years, Virginia Beach has planned significantly more, completing the construction of nine new schools.

In an effort to respond to the research question, have urban school divisions which constructed satisfactory school buildings utilized a team approach to planning as described in research literature, the researcher examined the planning process observed by the ten urban school divisions which constructed at least one new public school in the state of Virginia since 1984. One school from each of the ten urban divisions was selected for review thus producing a sample of two high

schools, two middle schools, and six elementary schools for study. See Figure 4 below.

School Divisions and Schools
Selected for Review

School Division	School
Chesapeake	Greenbrier Elementary
Fairfax	Willow Springs Elementary
Hopewell	Dupont Elementary
Newport News	Hines Middle
Norfolk	Tanner's Creek Elementary
Portsmouth	Churchland Academy
Richmond	Boushall Middle
Suffolk	Nansemond River High
Virginia Beach	Salem High
Williamsburg	D. J. Montague Elementary

Fig. 4. School divisions and schools selected for review.

Sample Selection

The sample selected for interview was drawn from an organization of urban schools, The Coalition of Virginia Urban School Divisions. The organization consists of seventeen school divisions from the state of Virginia, ten of which had constructed new schools in the past seven years.

One school from each of the ten divisions was selected for study. Since four of the ten divisions had constructed more than one school each, selection of a school from those four divisions was made by identifying the most recently constructed high school. If none were available, then the most recently constructed middle school or elementary school, respectively, was chosen.

Data Collection

Data was collected through personal interviews. An interview was conducted with a central office administrator from each division, the current building principal of each of the ten identified schools, two classroom teachers presently serving in each of the identified buildings, the building custodian, and a PTA member. Sixty personal interviews were conducted.

Interviewees were selected according to the following procedure. To select a central office administrator, a phone call was placed to the central office of each division in the sample to determine the name of the individual most knowledgeable of the planning process used to construct new buildings. To select teachers and a PTA member, an additional phone call was placed to each building principal requesting a personal interview with the principal, two teachers, the building custodian, and a PTA member. Subsequently, building principals scheduled times for each interview and personally selected the teachers and the PTA members who participated in the study.

The purpose of interviewing six representatives from each sample division was to measure the degree of satisfaction urban school divisions have with newly constructed schools. Specifically, each interviewee was asked to respond to a series of ten statements designed to measure satisfaction. Based on interview responses, three schools were identified as the most satisfactory. In addition to responding to statements which measured satisfaction, central office administrators were asked to respond to a series of questions which were designed to determine how school divisions planned the construction of new schools. Planning variables of the three most satisfactory schools were subsequently examined.

Interview Instruments

A personal interview was conducted with a central office administrator, the current building principal, two classroom teachers, the building custodian, and a PTA member of each identified school. Therefore, six persons were interviewed from each school division. The purpose of the interviews was two fold: to measure the degree of satisfaction urban school divisions have with new school buildings and to identify the planning variables used by each school division when constructing a new school.

Two interview instruments were developed by the researcher. One instrument was designed to measure the degree of satisfaction urban school divisions have with recently constructed schools. (See Appendix A.) It was administered to all six interviewees from each sample school division. Interviewees were asked to respond to ten prepared statements. Responses were assigned numerical value based on a Likert-type scale.

The second instrument, which consisted of seven specific questions, was designed to identify the planning variables used by each school division when constructing a new school. (See Appendix B.) It was administered to the central office administrator of each sample school division. Responses were tabulated and presented in Chapter Four.

The interview instruments were developed based on the works of Raymond L. Gorden, Borg and Gaul, and Fred Kerlinger.[3] Each interview question and each statement used to measure satisfaction were reviewed by Dr. W. Randolph Nichols, the Deputy Superintendent of Chesapeake Public Schools and an Adjunct Professor for Old Dominion University and Norfolk State University. Dr. Nichols has taught

the School Plants course for both universities. Further reviews were made by Dr. Lenard J. Wright, Supervisor of Planning and Development for Chesapeake Public Schools and, subsequently, by a certified architect, Mr. Harlen N. Hiller, AIA, CSI. Dr. Nichols, Dr. Wright and Mr. Hiller expressed the opinion, independent of each other, that the interview instruments administered as described above would be capable of producing a measure of satisfaction and a list of planning variables. Thus, the interview instruments were validated before they were administered. (See Appendices E, F and G for validation statements.)

Justification of the Design

Kerlinger has described the personal interview as the most powerful and useful tool of social scientific research, one that permits probing into the context and reasons for answers to questions.[4] Borg and Gaul stated that this method not only provides immediate feedback but also provides more data and greater clarity than other methods of data collection.[5]

While there are many advantages to selecting the personal interview as a method of collecting data regarding new school construction, the greatest advantage was the opportunity to visit and tour each school selected for sample. Direct and personal contact with representatives of each urban school division produced information which could not have been obtained through any other means of data collection.

Procedures for the Study

The four questions under investigation are:

1. What is the degree of satisfaction urban school divisions have with newly constructed school buildings?

2. Which school buildings constructed by urban school divisions were perceived as the most satisfactory?

3. Which of the seven planning variables identified in research literature were used by urban school divisions which constructed buildings perceived as the most satisfactory?

4. Have urban school divisions which constructed buildings perceived as satisfactory used the "team approach" to planning as described in research literature?

Since the research questions are progressive in nature, that is, planning variables of exemplary schools must be identified before use of the "team approach" can be determined, the study has been presented in four progressive phases, one phase for each research question cited above.

Phase One of the study determines the degree of satisfaction urban school divisions have with newly constructed schools. The researcher visited each school building in the sample, conducted personal interviews with six individuals representing the school, and requested a guided tour and a floor plan of each facility. To measure satisfaction selected urban school divisions have with new schools, six persons, a central office administrator, the building principal, two teachers, the building custodian, and a PTA member, were interviewed from each division. Each interviewee was asked to respond to the following ten statements designed to measure satisfaction by responding strongly agree, agree, undecided, disagree, or strongly disagree.

1. The building meets the expectations for which it was designed.

2. The building has an adequate number of spaces to house the entire student population.

3. The building has an adequate number of spaces to accommodate the instructional program.

4. Each space of the building is of sufficient size and shape.

5. The building has adequate space for the extracurricular, athletic, and social activities of pupils.

6. The building operates as a unit with all parts located in a proper relationship so that activities can be conducted efficiently, conveniently, and safely.

7. The building provides a safe and comfortable learning environment for pupils.

8. The building needs no modification.

9. The building does not, in any way, inhibit the instructional program.

10. The building does not, in any way, adversely affect the learning of pupils.

Responses were tape recorded by the researcher. Additionally, all responses were noted by the researcher in writing. Concomitantly, responses were synthesized by comparing notations to the tape recordings for accuracy.

Points were assigned based on a Likert-type scale where a response of strongly agree earned five points, agree earned four points, undecided earned three points, disagree earned two points, and strongly disagree earned one point. Given ten statements, an interviewee could earn points ranging from a low of 10 points to a high of 50 points. Consequently, six interviewees from a school division could earn total points ranging from a low of 60 to a high of 300.

Points were totaled by statement. Thus, six interviewees responding to statement one, "The building meets the expectations for which it was designed," could earn points ranging from a minimum of six to a maximum of 30. The following figure illustrates the method in which points were recorded and subsequently totaled for each statement designed to measure satisfaction.

POINT VALUE ASSIGNMENTS FOR RESPONSES TO ALL STATEMENTS MEASURING SATISFACTION

Point Value for Responses:

Strongly Agree - 5 Agree - 4 Undecided - 3 Disagree - 2 Strongly Disagree - 1

DIVISION: Chesapeake	Central Office Administrator	Principal	Teacher A	Teacher B	Custodian	PTA Member	Total
The building meets the expectations for which it was designed.	4	5	5	4	5	4	27

Fig. 5. Point value assignments for responses to all statements measuring satisfaction.

(The number of points assigned to each interview response are presented in Appendix F.) Mean and standard deviation scores were calculated for each statement and presented in Chapter Four.

Phase Two identifies those buildings which were perceived as the most satisfactory. Points earned by six interviewees responding to ten statements were added together to produce a division total. Total points were used to measure the degree of satisfaction urban school divisions have with newly constructed school buildings. The three school divisions earning the highest number of points were classified as the most satisfactory and labeled, exemplary.

Phase Three identifies the planning variables used by urban divisions which constructed the most satisfactory schools. Planning variables were identified by asking central office administrators of all ten divisions to participate in a second interview. Each was asked to respond to a series of questions designed to determine which of the following variables are used in planning new school construction:

1. involves more than one individual in collecting data;
2. provides quantitative data to the architect;
3. provides qualitative data to the architect;
4. provides data to the architect in advance of design;
5. provides data to the architect in written form;
6. provides original data, not prototype data; and

7. provides data which is used by the architect.

Administrators were asked who had been involved in planning new schools, what kinds of information had been presented to the architect, when, and in what format such information had been provided. The interview instrument used to ask these questions can be found in Appendix B.

Planning variables used by each school division in the sample have been reported in Chapter Four. The planning variables reported by the three divisions constructing exemplary schools have been extensively examined, presented in Chapter Four, and discussed in Chapter Five.

Phase Four of the study determines utilization or non-utilization of the "team approach" to planning by those school divisions identified as constructing exemplary schools. To be classified as using the "team approach" an urban school division incorporated all seven planning variables when preparing for construction. Since the "team approach" is a method of planning based on the premise that, " ... there are no inherited building plans,"[6] each building must be unique, requiring that original data be presented to the architect in written form in advance of building design. Divisions which used all seven variables were reported as using a "team approach" to planning as described in research literature.

Strengths and Weaknesses of the Design

There are two major concerns with the interview method of data collection, the time involved in meeting with the group selected for sample and the interpretation of data collected by an inexperienced interviewer. Precautions were taken to address both concerns.

The researcher provided a block of uninterrupted time for purposes of interviewing. Substantial time was allocated for each individual interview at the convenience of the interviewee. Interviewees were encouraged to take as much time as was desired in sharing responses.

Each interview was tape recorded so that participants would not be distracted by excessive writing. Approximately ten hours of interviews were taped. Each interview tape was reviewed by the researcher and the data collected was presented in table format.

Finally, all interview data was extensively reviewed and evaluated by a school plant planning expert before conclusions and recommendations were made. Standards established for analyzing data were based on an extensive literature review and documented as valid by established authorities in the field of school plant planning.

1. "Average Public School Building Costs," a report provided by the State Department of Education, Division of Energy and Facilities (Reports for years 1979-1989).

2. Ibid.

3. Raymond L. Gorden, Interviewing Strategy, Techniques, and Tactics (Chicago: The Dorsey Press, 1987), 5-57, 591-613; Walter R. Borg and Meredith Damien Gall, Educational Research, Fourth Edition, (New York: Longman, 1983), 436-446; and Fred N. Kerlinger, Foundations of Behavioral Research (New York: Holt, Rinehart and Winston, Inc., 1973), 412-490.

4. Kerlinger, 412.

5. Borg and Gaul, 436.

6. William W. Caudill, Toward Better School Design (New York: F. W. Dodge Corporation, 1954), 186.

CHAPTER IV

ANALYSIS OF THE DATA

This chapter presents interview data which was collected during on site visitations to ten urban school buildings in the state of Virginia. The problem under review was, "Have urban school divisions which constructed satisfactory school buildings utilized a 'team approach' to planning as described in research literature?" To investigate the problem, the following questions were addressed:

1. What is the degree of satisfaction urban school divisions have with newly constructed school buildings?
2. Which school buildings constructed by urban school divisions were perceived as the most satisfactory?
3. Which of the seven planning variables identified in research literature were used by urban school divisions which constructed buildings perceived as the most satisfactory?
4. Have urban school divisions which constructed buildings perceived as satisfactory used the "team approach" to planning as described in research literature?

A measure of satisfaction was taken for each building visited. Three buildings were identified as the most satisfactory and labeled exemplary. Planning variables used by each urban school division were identified. Planning variables used by the divisions constructing exemplary schools were extensively examined. Finally, utilization of the "team approach" or non-utilization of the "team approach" by divisions planning exemplary schools was determined. The chapter has been divided into four sections, one for each research question cited above.

What is the Degree of Satisfaction Urban School Divisions Have with Newly Constructed School Buildings?

Sixty individuals representing ten urban school divisions which had constructed new school buildings in the state of Virginia since 1984 were interviewed in this study. Six persons, one central office administrator, the building principal, two teachers, the custodian, and a PTA member were interviewed from each division. Therefore, interviews were conducted with ten central office administrators, ten building principals, twenty classroom teachers, ten custodians, and ten PTA members representing two senior high schools, two middle schools and six elementary schools. Of the sixty interviewees, thirty were male and thirty were female, thirty-nine were white and twenty-one were minority. While interviews with central office administrators were conducted in thirty minute sessions, remaining interviews were conducted in ten minute sessions. The personal interviews were used to measure the degree of satisfaction representatives from each division have with newly constructed school buildings. Each interviewee was asked to respond to ten statements designed to measure satisfaction by stating either strongly agree, agree, undecided, disagree, or strongly disagree.

A Likert-type scale was used to assign points to the responses of each person interviewed. Points were totaled for each statement. Subsequently, mean and standard deviation scores were calculated. Calculations were performed on a computer spreadsheet using the program Quattro Pro. The following ten tables, one for each statement designed to measure satisfaction, present the mean and standard deviation scores for all ten urban school divisions. Each table lists the ten school divisions in the sample and a statement designed to measure satisfaction with mean and standard deviation calculations.

TABLE 1

MEAN AND STANDARD DEVIATION SCORES FOR STATEMENTS DESIGNED TO MEASURE SATISFACTION WITH NEWLY CONSTRUCTED SCHOOL BUILDINGS OF SELECTED URBAN SCHOOL DIVISIONS

Statement # 1

The building meets the expectations for which it was designed.

Division	Mean	Standard Deviation
Chesapeake	4.5000	0.5477
Fairfax	4.5000	0.5477
Hopewell	4.5000	0.5477
Newport News	4.3333	0.5164
Norfolk	4.3333	0.8165
Portsmouth	4.3333	0.5164
Richmond	4.5000	0.5477
Suffolk	4.5000	0.5477
Virginia Beach	4.3333	0.5164
Williamsburg	4.0000	1.0954

TABLE 2

MEAN AND STANDARD DEVIATION SCORES FOR STATEMENTS DESIGNED TO MEASURE SATISFACTION WITH NEWLY CONSTRUCTED SCHOOL BUILDINGS OF SELECTED URBAN SCHOOL DIVISIONS

Statement # 2

The building has an adequate number of spaces to house the entire student population.

Division	Mean	Standard Deviation
Chesapeake	4.3333	0.5164
Fairfax	4.8333	0.4082
Hopewell	3.0000	1.0954
Newport News	3.5000	0.8367
Norfolk	4.8333	0.4082
Portsmouth	3.0000	1.0954
Richmond	3.8333	0.9832
Suffolk	4.3333	0.5164
Virginia Beach	2.8333	1.3292
Williamsburg	3.0000	1.2649

TABLE 3

MEAN AND STANDARD DEVIATION SCORES FOR STATEMENTS DESIGNED TO MEASURE SATISFACTION WITH NEWLY CONSTRUCTED SCHOOL BUILDINGS OF SELECTED URBAN SCHOOL DIVISIONS

Statement # 3

The building has an adequate number of spaces to accommodate the instructional program.

Division	Mean	Standard Deviation
Chesapeake	4.0000	1.0954
Fairfax	4.8333	0.4082
Hopewell	3.1667	1.3292
Newport News	3.6667	0.8165
Norfolk	4.8333	0.4082
Portsmouth	3.0000	1.0954
Richmond	3.6667	0.8165
Suffolk	4.3333	0.5164
Virginia Beach	3.3333	1.5055
Williamsburg	3.6667	0.8165

TABLE 4

MEAN AND STANDARD DEVIATION SCORES FOR STATEMENTS DESIGNED TO MEASURE SATISFACTION WITH NEWLY CONSTRUCTED SCHOOL BUILDINGS OF SELECTED URBAN SCHOOL DIVISIONS

Statement # 4

Each space of the building is of sufficient size and shape.

Division	Mean	Standard Deviation
Chesapeake	3.8333	1.1690
Fairfax	3.6667	1.3663
Hopewell	3.5000	1.2247
Newport News	3.3333	1.0328
Norfolk	4.5000	0.5477
Portsmouth	2.8333	0.9832
Richmond	4.1667	0.4082
Suffolk	3.8333	0.7528
Virginia Beach	2.8333	1.4720
Williamsburg	4.0000	1.0954

TABLE 5

MEAN AND STANDARD DEVIATION SCORES FOR STATEMENTS DESIGNED TO MEASURE SATISFACTION WITH NEWLY CONSTRUCTED SCHOOL BUILDINGS OF SELECTED URBAN SCHOOL DIVISIONS

Statement # 5

The building has adequate space for the extracurricular, athletic, and social activities of pupils.

Division	Mean	Standard Deviation
Chesapeake	3.8333	0.9832
Fairfax	4.6667	0.5164
Hopewell	3.6667	1.0328
Newport News	4.0000	0.0000
Norfolk	5.0000	0.0000
Portsmouth	3.8333	0.9832
Richmond	4.6667	0.5164
Suffolk	4.5000	0.5477
Virginia Beach	3.6667	1.3663
Williamsburg	3.1667	1.7224

TABLE 6

MEAN AND STANDARD DEVIATION SCORES FOR STATEMENTS DESIGNED TO MEASURE SATISFACTION WITH NEWLY CONSTRUCTED SCHOOL BUILDINGS OF SELECTED URBAN SCHOOL DIVISIONS

Statement # 6

The building operates as a unit with all parts located in a proper relationship so that activities can be conducted efficiently, conveniently, and safely.

Division	Mean	Standard Deviation
Chesapeake	4.5000	0.5477
Fairfax	4.3333	0.5164
Hopewell	3.6667	0.8165
Newport News	4.6667	0.5164
Norfolk	4.6667	0.5164
Portsmouth	4.3333	0.5164
Richmond	4.5000	0.5477
Suffolk	4.0000	1.0954
Virginia Beach	3.6667	1.3663
Williamsburg	4.5000	0.5477

TABLE 7

MEAN AND STANDARD DEVIATION SCORES FOR STATEMENTS DESIGNED TO MEASURE SATISFACTION WITH NEWLY CONSTRUCTED SCHOOL BUILDINGS OF SELECTED URBAN SCHOOL DIVISIONS

Statement # 7

The building provides a safe and comfortable learning environment for pupils.

Division	Mean	Standard Deviation
Chesapeake	4.5000	0.5477
Fairfax	4.8333	0.4082
Hopewell	4.8333	0.4082
Newport News	4.6667	0.5164
Norfolk	4.8333	0.4082
Portsmouth	4.6667	0.5164
Richmond	4.5000	0.5477
Suffolk	4.5000	0.5477
Virginia Beach	3.3333	1.5055
Williamsburg	4.3333	0.5164

TABLE 8

MEAN AND STANDARD DEVIATION SCORES FOR STATEMENTS DESIGNED TO MEASURE SATISFACTION WITH NEWLY CONSTRUCTED SCHOOL BUILDINGS OF SELECTED URBAN SCHOOL DIVISIONS

Statement # 8

The building needs no modification.

Division	Mean	Standard Deviation
Chesapeake	2.6667	1.0328
Fairfax	3.0000	1.5492
Hopewell	2.5000	0.8367
Newport News	3.3333	1.0328
Norfolk	3.1667	1.1690
Portsmouth	2.6667	1.0328
Richmond	2.6667	1.0328
Suffolk	3.1667	1.3292
Virginia Beach	2.5000	1.3784
Williamsburg	3.6667	1.2111

TABLE 9

MEAN AND STANDARD DEVIATION SCORES FOR STATEMENTS DESIGNED TO MEASURE SATISFACTION WITH NEWLY CONSTRUCTED SCHOOL BUILDINGS OF SELECTED URBAN SCHOOL DIVISIONS

Statement # 9

The building does not, in any way, inhibit the learning of pupils.

Division	Mean	Standard Deviation
Chesapeake	4.1667	0.4082
Fairfax	3.5000	1.2247
Hopewell	3.3333	1.0328
Newport News	4.5000	0.5477
Norfolk	4.5000	0.5477
Portsmouth	4.0000	0.0000
Richmond	4.3333	0.5164
Suffolk	3.8333	1.1690
Virginia Beach	3.0000	1.2649
Williamsburg	4.0000	1.0954

TABLE 10

MEAN AND STANDARD DEVIATION SCORES FOR STATEMENTS DESIGNED TO MEASURE SATISFACTION WITH NEWLY CONSTRUCTED SCHOOL BUILDINGS OF SELECTED URBAN SCHOOL DIVISIONS

Statement # 10

The building does not, in any way, adversely affect the learning of pupils.

Division	Mean	Standard Deviation
Chesapeake	4.1667	0.4082
Fairfax	3.8333	1.4720
Hopewell	4.1667	0.4082
Newport News	4.5000	0.5477
Norfolk	4.6667	0.5164
Portsmouth	4.1667	0.4082
Richmond	4.3333	0.5164
Suffolk	4.6667	0.5164
Virginia Beach	3.3333	1.5055
Williamsburg	4.0000	1.0954

Which School Buildings Constructed by Urban School Divisions Were Perceived as the Most Satisfactory?

A composite of points assigned to a school division was produced to illustrate the total number of points a school division earned when all sixty responses were tallied. Table 11 lists ten school divisions, six interviewees from each division, total points earned by each individual interviewee and total points earned by each school division. The three divisions earning the highest number of points and, therefore, identified as constructing the most satisfactory school buildings are noted with an asterisk.

TABLE 11

COMPOSITE OF POINTS ASSIGNED TO EACH INTERVIEWEE

	Administrator	Principal	Teacher A	Teacher B	Custodian	PTA Member	Total
Chesapeake	36	46	47	35	42	38	243
Fairfax	44	49	38	37	48	36	252 *
Hopewell	38	37	39	33	37	40	218
Newport News	43	42	39	41	40	38	243
Norfolk	44	50	45	42	46	45	272 *
Portsmouth	39	43	32	38	34	35	221
Richmond	44	39	38	38	45	43	247
Suffolk	49	39	42	41	40	39	250 *
Va. Beach	49	44	23	22	28	31	197
Williamsburg	38	42	49	25	38	38	230

* Exemplary schools, buildings perceived as the most satisfactory.

Source: Personal interviews conducted in April and May, 1991.

School building measurements ranging from least satisfactory to most satisfactory are presented in Figure 7 below. Salem High School in Virginia Beach was reported as the least satisfactory of all schools in the sample while Tanner's Creek Elementary School in Norfolk was reported as the most satisfactory.

Total Points Measuring Building Satisfaction

School	Division	Points
Salem High	Virginia Beach	197
Dupont Elementary	Hopewell	218
Churchland Academy	Portsmouth	221
D. J. Montague	Williamsburg	230
Greenbrier Elementary	Chesapeake	243
Hines Middle	Newport News	243
Boushall Middle	Richmond	247
Nansemond River High	Suffolk	250
Willow Springs Elementary	Fairfax	252
Tanner's Creek Elementary	Norfolk	272

Fig. 6. School building measurements ranging from least satisfactory to most satisfactory.

The three divisions earning the highest number of points are Suffolk, Fairfax, and Norfolk. Nansemond River High School in Suffolk, Willow Springs Elementary School in Fairfax, and Tanner's Creek Elementary School in Norfolk have been identified as the most satisfactory schools in this study.

Which of the Seven Planning Variables Identified in Research Literature Were Used by Urban School Divisions Which Constructed Buildings Perceived as the Most Satisfactory?

Table 12 lists the seven variables of the "team approach," the ten school divisions in the study, and interview responses as perceived by the researcher.

TABLE 12

PLANNING VARIABLES UTILIZED BY SELECTED URBAN SCHOOL DIVISIONS WHEN CONSTRUCTING NEW SCHOOL BUILDINGS

Variables of planning:

1. involves more than one individual in collecting data
2. provides quantitative data to the architect
3. provides qualitative data to the architect
4. provides data to the architect in advance of design
5. provides data to the architect in written form
6. provides original data, not prototype data
7. provides data which is used by the architect

	Variables of Planning						
School Division	1	2	3	4	5	6	7
Chesapeake	YES	YES	YES	YES	YES	NO	YES
Fairfax	YES	YES	YES	YES	YES	NO	YES
Hopewell	YES	YES	YES	YES	YES	NO	YES
Newport News	YES	YES	YES	YES	YES	NO	YES
Norfolk	YES	YES	YES	YES	YES	YES	YES
Portsmouth	YES	YES	YES	YES	YES	YES	YES
Richmond	YES	YES	YES	YES	YES	YES	YES
Suffolk	YES	YES	YES	YES	YES	NO	YES
Virginia Beach	YES	YES	YES	YES	YES	NO	YES
Williamsburg	YES	YES	YES	YES	YES	YES	NO

Source: Personal interviews conducted in April and May, 1991.

Central office administrators who participated in this study were administered two interviews. In addition to responding to statements designed to measure satisfaction with newly constructed school buildings, they were asked to identify the planning process used when constructing new schools. (See Appendix B for Interview Instrument.) Specifically, questions designed to identify which of the seven planning variables identified in literature as the "team approach" are used by each division were asked. Responses to questions perceived by the researcher as an indication that a variable was utilized have been recorded in the affirmative with a yes. Those responses perceived as an indication that a variable was not utilized have been recorded in the negative with a no.

Planning variables used by the three schools identified in this study as most satisfactory have been examined to a greater degree. Tanner's Creek Elementary School of Norfolk, Willow Springs Elementary School of Fairfax, and Nansemond River High School of Suffolk were identified from the sample of ten urban school buildings as the most satisfactory and labeled exemplary. The three exemplary schools earned 272, 252, and 250 points respectively out of a possible 300 points. The planning variables utilized by these divisions have been examined more closely and presented in Table 13. Table 13, which follows, cites the seven planning variables, identified in research literature as the "team approach" to planning, the three school buildings perceived as exemplary, and identifies the planning variables utilized by each division when planning for new school construction. Furthermore, the table clarifies a response made by one of the divisions which constructed an exemplary school. A discussion resulting from this examination is presented in Chapter Five.

TABLE 13

PLANNING VARIABLES UTILIZED BY URBAN SCHOOL DIVISIONS WHICH CONSTRUCTED SCHOOL BUILDINGS PERCEIVED AS THE MOST SATISFACTORY

	Schools Perceived as the Most Satisfactory		
Variables of planning	Tanner's Creek Elementary Norfolk	Willow Springs Elementary Fairfax	Nansemond River High School Suffolk
involves more than one individual in collecting data	YES	YES	YES
provides quantitative data to the architect	YES	YES	YES
provides qualitative data to the architect	YES	YES	YES
provides data to the architect in advance of the design	YES	YES	YES
provides data to the architect in written form	YES	YES	YES
provides original data, not prototype data	YES *	NO	NO
provides data which is used by the architect	YES	YES	YES

* Norfolk clarified this YES by stating that although original data has been provided for school construction in the past, consideration is currently being given to prototyping data in the future.

Source: Personal interviews conducted in April and May, 1991.

Have Urban School Divisions Which Constructed Buildings Perceived As Satisfactory Used the "Team Approach" to Planning As Described in Research Literature?

All seven planning variables must be present to identify a process as the "team approach" to planning for new school construction. While each individual variable represents a significant aspect of planning, a variable in isolation of the others will not produce a successful design. All seven variables operating collectively form the "team approach" to planning. Therefore, of the three urban school divisions which have constructed exemplary schools, only Norfolk utilizes the "team approach" to planning as defined in research literature.

While both Fairfax and Suffolk have used six of the variables identified as the "team approach," both divisions have failed to supply architects with original data for each new school constructed. That is, these divisions have not formed separate and distinct committees which researched the unique functions to be housed in each new school constructed and therefore have failed to collect quantitative and qualitative data exclusively for use by each building constructed. Fairfax and Suffolk have opted to use prototype data when planning for the construction of new school buildings, preferring to duplicate as much quantitative and qualitative data as possible.

Recommendations and implications resulting from these findings have been reported in Chapter Five.

CHAPTER V

RECOMMENDATIONS AND CONCLUSIONS

This chapter provides conclusions and recommendations resulting from an investigation of the planning process observed by urban school divisions when planning for new school construction. The chapter is outlined as follows:

Summary of the Investigation,
Conclusions Drawn from the Study,
Limitations of the Study,
Recommendations Resulting from the Investigation,
Implications for Further Research, and
Closing Remarks.

Summary of the Investigation

This study examined utilization of the "team approach" to planning as a process for constructing satisfactory school buildings. The problem under review was, "Have urban school divisions which constructed satisfactory school buildings utilized a 'team approach' to planning as described in research literature?" In an effort to research the problem, the following questions were addressed:

1. What is the degree of satisfaction urban school divisions have with newly constructed school buildings?
2. Which school buildings constructed by urban school divisions were perceived as the most satisfactory?
3. Which of the seven planning variables identified in research literature were used by urban school divisions which constructed buildings perceived as the most satisfactory?

4. Have urban school divisions which constructed buildings perceived as satisfactory used the "team approach" to planning as described in research literature?

Ten urban school buildings constructed within the past seven years were selected for review. A measure of satisfaction was taken for each of the ten new buildings. Three were identified as the most satisfactory and planning variables utilized by those divisions constructing the three most satisfactory schools were examined. Subsequently, a comparison was made with the planning variables defined in school plant literature as the "team approach" to planning for new schools.

The three schools perceived as the most satisfactory and labeled exemplary were Tanner's Creek Elementary School of Norfolk, Willow Springs Elementary School in Fairfax, and Nansemond River High School in Suffolk. To examine the planning variables utilized by each division when constructing new schools, personal interviews were conducted with Mr. Glen Capps, Director of School Facilities in Norfolk, Dr. Larry Hixson, Assistant Superintendent for Business Affairs in Suffolk, and Mr. Alton Hlavin, Assistant Superintendent for School Facilities in Fairfax. Of the three urban school divisions which constructed the exemplary schools, only Norfolk utilized the "team approach" to planning as defined in research literature. Both Suffolk and Fairfax observed all the variables which characterize the "team approach" with one exception. Neither provided original data to the architect for each new school when simultaneously constructing more than one new school building.

Conclusions Drawn from the Study

Conclusions resulting from this study were based upon an extensive examination of the planning variables used by those divisions constructing new

schools perceived as the most satisfactory. Specifically, the planning variables used by Norfolk, Suffolk, and Fairfax were examined. Mr. Capps of Norfolk, Dr. Hixson of Suffolk and Mr. Hlavin of Fairfax were asked to describe the planning process utilized by their respective divisions when constructing new school buildings. More specifically, each was asked to respond to seven questions designed to identify planning variables. (See Appendix B.) Subsequently, planning variables used by each of the three divisions were compared with the seven planning variables identified in research literature as the "team approach" to planning. The following conclusions are based on those comparisons.

1. **New school buildings perceived as the most satisfactory have been planned by more than a single individual. Specifically, the three exemplary schools identified in this study, Tanner's Creek Elementary of Norfolk, Nansemond River High in Suffolk, and Willow Springs Elementary in Fairfax, were each planned by a team of individuals. In each case, representatives from instructional specialty areas, maintenance departments, central office, civic groups, PTA organizations and teacher groups provided information which was presented to building architects.**

It is interesting to note, however, that while a variety of perspectives were utilized in planning, plans were not personalized. That is, in each exemplary school, the building principal became involved in planning after the school had been designed but before construction was completed. In fact, Mr. Glen Capps, Director of School Facilities in Norfolk, stated that his division avoided personalizing buildings. He commented, "We don't like to involve too many people from that particular schoolhouse."[1] Norfolk has developed a prototype classroom which is presented to the architect. For example, the prototype elementary classrooms are paired, connected by a restroom. Each elementary classroom has immediate access to restroom facilities. The result has been, according to Mr. Capps, an increase in

instructional time and a decrease in vandalism. The principal of Tanner's Creek Elementary in Norfolk agreed. Ms. Carolyn Sands said the school buildings are not designed for a single principal or a single personality. A philosophy for classroom design and construction has been adopted and, as in the example of the prototype classroom cited above, has proven to be successful.

Apparently, according to this research, the numbers of school plant planners employed by a school division have little or no impact on procuring a facility which is perceived as satisfactory. While Fairfax employs greater than 160 employees at the central office level to work specifically on school plant planning under an assistant superintendent for school facilities, Suffolk has none assigned for that specific purpose. Unlike Suffolk and Norfolk divisions which appointed educational specifications committee specifically for the schools cited in this study, Fairfax does not form a committee with each new school constructed. As a result of the excessive amount of school construction in Fairfax, a standing elementary committee exists for the purpose of preparing educational specifications for elementary schools and a separate committee remains in tact for planning secondary buildings.[2]

Additionally, according to this research, the fact that a school division has established experience in new school construction has little impact on procuring a facility which has been perceived as satisfactory. While Fairfax has constructed a number of school buildings in the past seven years, Suffolk has constructed two new buildings and Norfolk only one. However, all three divisions have involved a number of persons in a united effort to plan construction.

2. **The three exemplary schools identified in this study were planned by a team of individuals who prepared quantitative data for architects. More specifically, architects were told how many students to expect, how many teachers to expect, the number of courses to be taught, and other essential quantitative information.**

Each of the three exemplary buildings provided essential quantitative data to architects. However, it must be noted that each building has surplus classroom space. In the case of Fairfax, a division which has experienced the adversities of rapid growth in student population, Willow Springs Elementary was designed for a student population of 950, and currently houses 479. This extreme example of surplus space provides an inordinate number of available classrooms for use by the faculty, staff, and PTA groups. Both Nansemond River High and Tanner's Creek Elementary, as of this writing, have vacant classrooms. Nansemond River was designed for 1500 pupils and currently houses 1250. Tanner's Creek Elementary was designed for 840 pupils and houses 702.

3. **The three exemplary schools identified in this study were planned by a team of individuals who prepared qualitative data for architects.**

Qualitative data was supplied to architects by educators in Suffolk, Fairfax, and Norfolk. In the case of Nansemond River High School in Suffolk, a suite of special education classrooms was designed in the form of an assisted living facility based on qualitative data provided by educators. Recognizing the need for the mentally retarded and physically handicapped student to prepare for functional existence outside the classroom, this unique educational space has been designed based on information provided by users of the classroom. A living room with kitchen area, a bedroom, and a bathroom with changing facilities have been provided. Students and teachers occupy a space which is not only functional but which is modeled after commercial facilities designed to assist this special population.

Another example of the successful use of qualitative data can be found at Willow Springs Elementary in Fairfax where floor tiles in the cafeteria provide direction for students to enter the serving line of the kitchen. The principal, Mary Roots, explained that two shades of colored tile had been purchased for the floor.[3] Architects were informed of the daily routine students observe in the cafeteria, that is, standing in line to select food, and after eating, standing in line to return to the classroom. Given this qualitative data, architects used the information to place all dark colored tiles in a row, forming a line which students and teachers would subsequently utilize on a daily basis.

At Tanner's Creek Elementary in Norfolk, a change was made in the seating arrangements for the cafeteria from the traditional method of seating students in elementary schools throughout Norfolk. The principal, Ms. Carolyn Sands, observed that an increasing number of students had little exposure to traditional family dining where a small number of people were seated together, observing good table manners and pleasant meal conversation. Subsequently, long, institutional type tables were suggested as replacements for round tables which seat fewer students at a setting. Therefore, the cafeteria was planned for round dining tables rather than the long, rectangular ones traditionally used.[4] The result has been an improvement in the behavior of students during lunch time.

Although Tanner's Creek Elementary in Norfolk was rated as the most satisfactory building of those under review, and despite the fact that Norfolk has provided exceptional qualitative data to architects, a complaint with acoustics was identified. The cafeteria at Tanner's Creek Elementary in Norfolk has not been acoustically treated in an effective manner. However, the problem is an unresolved

issue and continues, as of this writing, to be addressed. Mr. Capps stated, "We seemed to have overlooked the auditorium/cafeteria concept as we put this space together. We have exposed beam trusses with no soft surfaces."[5] The architects have recognized the area as a problem and have agreed to investigate it. This is a significant finding since, as the literature states, acoustics has been a concern in school buildings since the earliest construction of schools.

While the other exemplary schools displayed no acoustical concerns, another division from the sample did. Hines Middle School in Newport News has suffered with acoustical complaints in the hallways and commons area around the entrance of the building.[6] Unfortunately, the lack of appropriate acoustics has been documented in school plant planning literature as an element which may inhibit the instruction of pupils and, consequently, adversely affect student learning.

4. **The three exemplary schools identified in this study utilized a process of planning where data was presented to the architects in advance of building design.**

Mr. Alton Hlavin, Assistant Superintendent for School Facilities in Fairfax, endorsed the necessity for architects to be fully aware of educators' expectations prior to building design. Mr. Hlavin, a participant in an international seminar on school facility construction in Europe in 1990, is intimately familiar with and highly endorses Caudill's "team approach" to planning the construction of new school buildings. Mr. Capps of Norfolk and Dr. Hixson of Suffolk agreed that architects must be presented with quantitative and qualitative data well in advance of building design.

5. **The three exemplary schools identified in this study utilized a process of planning where data was presented to the architects in written form.**

Written educational specifications have been presented to the architects of each of the three exemplary schools. The team of individuals assigned to prepare quantitative and qualitative data for the architects produced, in the case of each of the three exemplary schools, a written document commonly referred to as educational specifications.

6. **Although Norfolk's planning process for Tanner's Creek Elementary included supplying original data to architects, both Fairfax and Suffolk have supplied prototype data when simultaneously constructing more than one school.**

Experts in the field of school plant planning have repeatedly endorsed the necessity of supplying original information to architects. Caudill insisted that building designs could not be copied either in whole or in part. Repeating a design, no matter how worthwhile, is unacceptable. Every community has a right to expect an individual plan, a personalized design.[7]

Boles adamantly expressed an identical expectation, "no two schools ever should be alike because no two will serve identical pupil populations or be staffed by identical groups of adults."[8] Despite the overwhelming documentation denouncing prototyped data, interviews with school officials have revealed an insight which has yet to be found in school plant planning literature. Mr. Hlavin of Fairfax described a process of developing a plan which proves acceptable, getting the bugs out of it, and cloning it. He stated, "When we find a plan which is successful design-wise and it looks good aesthetically--the design is pleasing, and it is serving our educational program well, we will repeat it to the point where we have to move on to another."[9] Fairfax has repeated one particular design 6-8

times. Mr. Hlavin said that until the educational program changes significantly, as long as there is a winner, they stay with it.

Mr. Capps of Norfolk cited three specific advantages to using prototype data. First, he felt it was economically advantageous since the architectural and engineering fees are greatly reduced when designs are replicated. Second, he described an opportunity to build a known entity and therefore more accurately predict building cost. Third, Mr. Capps expressed a school division's right to take ownership of a design which has been prototyped.[10]

In the case of Suffolk, Dr. Hixson, Assistant Superintendent, described a unique justification for cloning building design. Educators in Suffolk were faced with dividing an existing high school facility which represented years of tradition in the community. Consequently, educators intentionally planned to create identical buildings, in fact, making an intense effort to be as identical as possible.[11]

The issue of using original or prototype data for each and every newly constructed school building is a philosophical issue which may require further investigation. If it is indeed a fact that buildings should be uniquely designed for function, then the question remains as to whether it is possible for the function of one building to be entirely identical to that of another.

Finally, Caudill did, in fact, address the issue of prototyping data. Although recognizing the tendency to design multiple schools simultaneously, Caudill barely tolerated the thought even when buildings were similar in appearance, similar in function, similar in environments, and similar in sets of circumstances. He denounced plans for duplication by stating, that school plant planners who duplicate "do not and cannot face the real needs of their client, in this case, the

pupil. They do not understand the necessity for planning the needs of school children through function to appearance."[12]

7. **The three exemplary schools identified in this study provided data which was used by architects.**

Central office administrators from the urban school divisions which constructed the three exemplary schools identified in this study agreed that, in each case, architects submitted designs based on the information which had been prepared and provided by educators.

All three central office administrators, Mr. Hlavin of Fairfax, Mr. Capps from Norfolk, and Dr. Hixson of Suffolk were asked to provide recommendations for changes in the existing planning process observed in their respective divisions. Mr. Capps of Norfolk stated he would like to see a process where instructional personnel could have unlimited vision when planning for new schools without a blank check. Mr. Hlavin would like to see a better job of evaluating new school buildings once they are constructed. Few instruments exist which have been designed primarily to measure satisfaction with newly constructed school buildings. In fact, one central office administrator interviewed requested permission to use the instrument provided in this study for measuring satisfaction with newly constructed school buildings since none were available.

Dr. Hixson suggested a more expedient planning process. In the case of Suffolk where one high school was abolished and the enrollment divided after two new ones were built, the process from beginning to end covered a decade. Ten years of planning a new building where both school boards and city councils change members is, according to Dr. Hixson and others interviewed in the Suffolk division, an excessive length of time for planning a new school building.

Limitations of the Study

The following limitations apply to this study:

1. Each of the three buildings perceived as the most satisfactory opened in the year in which the interview occurred. Of the ten urban school divisions selected for review, one other building opened in the year in which the interview occurred. The fact that interviewees were infatuated with the building's first year of operation may have been a contributing factor in the measure of building satisfaction.

2. In the case of each of the three buildings perceived as the most satisfactory, not one has reached enrollment capacity. In fact, each of the three exemplary buildings has surplus classroom space. Of the ten school buildings in the sample, seven have reached or exceeded capacity and the remaining three, those identified as exemplary, are under capacity. The assumption that surplus space in a school building nurtures satisfaction while insufficient space breeds dissatisfaction may have been a contributing factor in the measure of building satisfaction.

3. Both Norfolk and Suffolk are school divisions which have experienced minimal new construction within the past seven years. The excitement of new school construction after a dormant period of time may contribute to the measurement of satisfaction found in the study.

4. All interviews were conducted by an employee of one of the divisions selected for sample, a division which was not selected as one which constructed an exemplary building.

Recommendations Resulting From the Investigation

Conclusions drawn from this study have supported the following recommendations.

1. More than a single individual has been involved in planning the construction of those school buildings perceived in this study as the most satisfactory. Therefore, the findings suggest, as does school plant planning literature, that utilizing many individuals in planning the construction of new school buildings can produce a satisfactory building.

2. Overcrowded school buildings were not perceived as satisfactory. Specifically, the urban school division which constructed the building perceived as the least satisfactory was Virginia Beach, a division experiencing rapid growth in student population. Furthermore, the three school buildings perceived as the most satisfactory have surplus classroom space. The findings from this research, therefore, endorse the concept found in school

plant planning literature that school buildings which fail to accommodate the student population and the educational program without significant modification are unsatisfactory. Consequently, the research suggests that it is essential for educators to adequately forecast student enrollment to prevent the overcrowding of newly constructed schools.

3. Since acoustics has been an issue of concern addressed in school plant planning literature, and, since, it has also been addressed as a concern by urban divisions in this study, and, particularly by one of the divisions constructing an exemplary building, it is therefore suggested that educators provide considerable attention to the issue of poor acoustics in the design of new school buildings.

4. While school plant planning literature adamantly opposes the use of prototyped data in the construction of new schools, educators from this study who are responsible for constructing urban schools in the state of Virginia have expressed several advantages to using such data. Consequently, it is suggested that the issue of providing prototype data when planning the construction of new schools be explored in greater depth.

Implications for Further Research

There is much to be known regarding the planning process for new school construction. This study which focused specifically on the planning process referred to in the literature as the "team approach" was tested by a sample of urban school divisions in a state where no state funding is provided for new school construction. Consequently, the results of the study spawn many questions which demand intense review. For example,

1. Is there a difference in the planning process observed by urban educators in divisions where new school construction is financially supported by the state and those divisions such as in the state of Virginia where no state funding is provided for new school construction?

2. How does the planning process observed by urban educators compare with that of non-urban educators?

3. How does the planning process observed by urban educators which constructed those schools perceived as the most satisfactory compare with those who constructed schools perceived as the least satisfactory?

4. **Do users of a building which was designed with prototype data experience any significant difference in level of satisfaction than those users of a building where original data was provided?**

5. **Will the architects of the three buildings perceived as the most satisfactory agree that educators provided adequate and sufficient data when preparing for the design of the buildings?**

6. ***How does the information provided by educators to architects compare in quality to the information provided to architects by clients in the business community, such as bankers or lawyers?***

7. **Is there a difference in the level of satisfaction in a building constructed using only original data and one using prototype data?**

Closing Remarks

Educators and child psychologists have long recognized the importance of physical setting to the learning process. 'The need for healthful school surroundings. . .is not just a physical need; it is absolutely and unequivocally an educational need as well. 'Academic excellence is best achieved when the physical conditions for learning are also excellent.'[13]

The purpose of a schoolhouse is to provide an appropriate and functional environment for educating youth. An inappropriate or functionless environment inhibits the educational process.

The best assurance that the building planned will be successful and functional in design is to involve many perspectives in the planning process. As evidenced in this research, the most satisfactory school buildings have involved more than a single individual engaged in a united effort to prepare educational specifications for the building architect. While this study does not support the exclusive use of original data on each new school constructed, it does endorse the remaining variables of the "team approach" to planning as defined by William W. Caudill. Educators planning for new school construction, in an effort to protect the investment of the taxpayer, should ensure a successful building design by utilizing

those planning variables which have been grounded in theory, established in research, and endorsed by specialists in the field of school plant planning.

1. Interview with Mr. Glen Capps, Director of School Facilities, Norfolk Public Schools. April 29, 1991.

2. Interview with Mr. Alton Hlavin, Assistant Superintendent for School Facilities, Fairfax Public Schools, April 4, 1991.

3. Interview with Mary Roots, Principal, Willow Springs Elementary, Fairfax Public Schools. April 4, 1991.

4. Interview with Carolyn Sands, Principal, Tanner's Creek Elementary, Norfolk Public Schools. April 29, 1991.

5. Interview with Mr. Capps, April 29, 1991.

6. Interview with Bobby James, Principal, Hines Middle Schools, Newport News Public Schools, April 15, 1991.

7. William W. Caudill, Toward Better School Design (New York: F. W. Dodge Corporation, 1954), 198.

8. Harold Boles, Step by Step to Better School Facilities (New York: Holt, Rinehart, and Winston, Inc., 1965), 66.

9. Interview with Mr. Hlavin, April 4, 1991.

10. Interview with Mr. Capps, April 29, 1991.

11. Interview with Dr. Larry Hixson, Assistant Superintendent for Finance, Suffolk Public Schools, April 16, 1991.

12. Caudill, 17-18.

13. Kenneth Hansen, Public Education in American Society, 2nd Ed (Englewood Cliffs, New Jersey: Prentice Hall, 1956), p. 98 quoted in Phillip R. Piccigallo, "Renovating Urban Schools is Fundamental to Improving Them," Phi Delta Kappan (January, 1989): 406.

APPENDICES

APPENDIX A

Interview Instrument Which Measures Satisfaction

Satisfaction

LET'S TALK ABOUT HOW SATISFIED YOU ARE WITH THE BUILDING. PLEASE RESPOND TO THE FOLLOWING STATEMENTS BY REPLYING STRONGLY AGREE, AGREE. UNDECIDED, DISAGREE, OR STRONGLY DISAGREE.

1. The building meets the expectations for which it was designed.

2. The building has an adequate number of spaces to house the entire student population.

3. The building has an adequate number of spaces to accommodate the instructional program.

4. Each space of the building is of sufficient size and shape.

5. The building has adequate space for the extracurricular, athletic, and social activities of pupils.

6. The building operates as a unit with all parts located in a proper relationship so that activities can be conducted efficiently, conveniently, and safely.

7. The building provides a safe and comfortable learning environment for pupils.

8. The building needs no modification.

9. The building does not, in any way, inhibit the instructional program.

10. The building does not, in any way, adversely affect the learning of pupils.

APPENDIX B

Interview Instrument Which Determines Planning Variables

Planning Variables

Let's begin by talking about the planning process for new school construction.

1. Once the location of a school has been established and the land has been acquired, who becomes involved in preparing information for the architect?

2. What kind of information is shared with the architect? For example, is he told:

   how many students will occupy the building?

   the number of classrooms that will be needed?

   the size of central facilities?

   the types of classrooms (general, laboratory, specialized) that will be needed?

   the number of staff members that will be assigned to the building?

   whether the students drive or ride the bus?

3. What is the architect told about the instructional program? Is he told what children do in the classroom? Is he told their extracurricular activities? Is he told their athletic activities? Do you discuss with the architect the use of the building by civic groups?

4. At what stage of the planning, is the information you collected presented to the architect?

5. How is information shared with the architect? Is it discussed over the telephone; is a meeting held periodically; do you correspond in writing?

6. Is the process of planning a new school the same with each new building or do you ever duplicate another plan from a previously constructed school?

7. Has it been your experience that architects have prepared a design based on the information which you have provided?

APPENDIX C

Letter from Dr. W. Randolph Nichols
Validating Interview Instruments

Chesapeake Public Schools
School Administration Building
Post Office Box 15204
Chesapeake, Virginia 23328

April 1, 1991

Ms. Patricia L. Powers
409 Ballahack Road
Chesapeake, Virginia 23322

Dear Patricia:

I have reviewed the statements you have developed to measure satisfaction with newly constructed school buildings. Additionally, I have examined the questions designed to determine how educators plan for new school construction. Use of both instruments, I have determined, should provide you with a measure of satisfaction and a list of planning variables.

Respectfully,

W. R. Nichols

W. Randolph Nichols
Deputy Superintendent

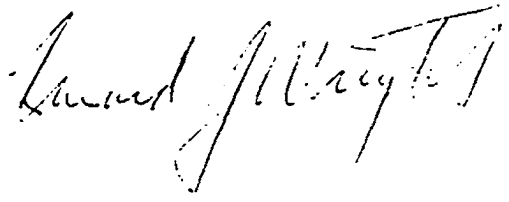
bhm

APPENDIX D

Memo from Dr. Lenard J. Wright
Validating Interview Instruments

TO: Patricia L. Powers
FROM: Lenard J. Wright
RE: Interview Questions
DATE: April 2, 1991

I have reviewed the research questions presented in your dissertation and the interview instrument which you developed. It is my opinion that you can answer your research questions with the responses you will receive when you administer your interview instrument.



APPENDIX E

Letter from Mr. Harlen N. Hiller, AIA, CSI
Validating Interview Instruments

608 Saber Drive
Chesapeake, Va. 23320
April 3, 1991

Mrs. Patricia L. Powers
409 Ballahack Road
Chesapeake, Virginia 23322

Dear Mrs. Powers:

Upon reviewing the research questions and interview instrument you provided I have determined that your method of interviewing urban school divisions is sufficient to accomplish your intended purpose.

If I can be of further service in this regard, please feel free to contact me.

Sincerely,

Harlen N. Hiller.

Harlen N. Hiller, AIA, CSI.

APPENDIX F

Tables Citing Point Value Assignments for Responses to All Statements Measuring Satisfaction

TABLE 14

POINT VALUE ASSIGNMENTS FOR RESPONSES TO ALL STATEMENTS MEASURING SATISFACTION

Point Value for Responses:

Strongly Agree - 5 Agree - 4 Undecided - 3 Disagree - 2 Strongly Disagree - 1

DIVISION: Chesapeake	Central Office Administrator	Principal	Teacher A	Teacher B	Custodian	PTA Member	Total
The building meets the expectations for which it was designed.	4	5	5	4	5	4	27
The building has an adequate number of spaces to house the entire student population.	4	5	5	4	4	4	26
The building has an adequate number of spaces to accommodate the instructional program.	4	5	5	2	4	4	24
Each space of the building is of sufficient size and shape.	2	5	5	3	4	4	23
The building has adequate space for the extracurricular, athletic, and social activities of pupils.	2	4	5	4	4	4	23
The building operates as a unit with all parts located in a proper relationship so that activities be conducted efficiently, conveniently, and safely.	5	5	5	4	4	4	27
The building provides a safe and comfortable learning environment for pupils.	5	5	5	4	4	4	27
The building needs no modification.	2	4	2	2	4	2	16
The building does not, in any way, inhibit the instructional program.	4	4	5	4	4	4	25
The building does not, in any way adversely affect the learning of pupils.	4	4	5	4	4	4	25

Source: Personal interviews conducted in April and May, 1991.

TABLE 15

POINT VALUE ASSIGNMENTS FOR RESPONSES TO ALL STATEMENTS MEASURING SATISFACTION

Point Value for Responses:

Strongly Agree - 5 Agree - 4 Undecided - 3 Disagree - 2 Strongly Disagree - 1

DIVISION: Fairfax	Central Office Administrator	Principal	Teacher A	Teacher B	Custodian	PTA Member	Total
The building meets the expectations for which it was designed.	4	5	4	5	5	4	27
The building has an adequate number of spaces to house the entire student population.	5	5	5	5	5	4	29
The building has an adequate number of spaces to accommodate the instructional program.	5	5	5	5	5	4	29
Each space of the building is of sufficient size and shape.	5	5	4	2	4	2	22
The building has adequate space for the extracurricular, athletic, and social activities of pupils.	5	5	5	5	4	4	28
The building operates as a unit with all parts located in a proper relationship so that activities be conducted efficiently, conveniently, and safely.	4	5	4	4	5	4	26
The building provides a safe and comfortable learning environment for pupils.	5	5	5	5	5	4	29
The building needs no modification.	2	5	2	2	5	2	18
The building does not, in any way, inhibit the instructional program.	4	4	2	2	5	4	21
The building does not, in any way adversely affect the learning of pupils.	5	5	2	2	5	4	23

Source: Personal interviews conducted in April and May, 1991.

TABLE 16

POINT VALUE ASSIGNMENTS FOR RESPONSES TO ALL STATEMENTS MEASURING SATISFACTION

Point Value for Responses:

Strongly Agree - 5 Agree - 4 Undecided - 3 Disagree - 2 Strongly Disagree - 1

DIVISION: Hopewell	Central Office Administrator	Principal	Teacher A	Teacher B	Custodian	PTA Member	Total
The building meets the expectations for which it was designed.	5	4	4	4	5	5	27
The building has an adequate number of spaces to house the entire student population.	2	2	4	2	4	4	18
The building has an adequate number of spaces to accommodate the instructional program.	2	2	4	2	5	4	19
Each space of the building is of sufficient size and shape.	4	4	5	2	2	4	21
The building has adequate space for the extracurricular, athletic, and social activities of pupils.	5	4	2	3	4	4	22
The building operates as a unit with all parts located in a proper relationship so that activities be conducted efficiently, conveniently, and safely.	4	2	4	4	4	4	22
The building provides a safe and comfortable learning environment for pupils.	4	5	5	5	5	5	29
The building needs no modification.	4	2	3	2	2	2	15
The building does not, in any way, inhibit the instructional program.	4	2	4	4	2	4	20
The building does not, in any way adversely affect the learning of pupils.	4	4	4	5	4	4	25

Source: Personal interviews conducted in April and May, 1991.

TABLE 17

POINT VALUE ASSIGNMENTS FOR RESPONSES TO ALL STATEMENTS MEASURING SATISFACTION

Point Value for Responses:

Strongly Agree - 5 Agree - 4 Undecided - 3 Disagree - 2 Strongly Disagree - 1

DIVISION: Newport News	Central Office Administrator	Principal	Teacher A	Teacher B	Custodian	PTA Member	Total
The building meets the expectations for which it was designed.	5	4	4	5	4	4	26
The building has an adequate number of spaces to house the entire student population.	4	4	3	4	4	2	21
The building has an adequate number of spaces to accommodate the instructional program.	4	4	4	4	4	2	22
Each space of the building is of sufficient size and shape.	4	4	2	2	4	4	20
The building has adequate space for the extracurricular, athletic, and social activities of pupils.	4	4	4	4	4	4	24
The building operates as a unit with all parts located in a proper relationship so that activities be conducted efficiently, conveniently, and safely.	4	5	5	5	4	5	28
The building provides a safe and comfortable learning environment for pupils.	4	5	5	5	4	5	28
The building needs no modification.	4	4	2	2	4	4	20
The building does not, in any way, inhibit the instructional program.	5	4	5	5	4	4	27
The building does not, in any way adversely affect the learning of pupils.	5	4	5	5	4	4	27

Source: Personal interviews conducted in April and May, 1991.

TABLE 18

POINT VALUE ASSIGNMENTS FOR RESPONSES TO ALL STATEMENTS MEASURING SATISFACTION

Point Value for Responses:

Strongly Agree - 5 Agree - 4 Undecided - 3 Disagree - 2 Strongly Disagree - 1

DIVISION: Norfolk	Central Office Administrator	Principal	Teacher A	Teacher B	Custodian	PTA Member	Total
The building meets the expectations for which it was designed.	5	5	4	5	4	3	26
The building has an adequate number of spaces to house the entire student population.	5	5	5	4	5	5	29
The building has an adequate number of spaces to accommodate the instructional program.	5	5	5	5	4	5	29
Each space of the building is of sufficient size and shape.	4	5	4	4	5	5	27
The building has adequate space for the extracurricular, athletic, and social activities of pupils.	5	5	5	5	5	5	30
The building operates as a unit with all parts located in a proper relationship so that activities be conducted efficiently, conveniently, and safely.	4	5	4	5	5	5	28
The building provides a safe and comfortable learning environment for pupils.	5	5	5	4	5	5	29
The building needs no modification.	2	5	3	2	4	3	19
The building does not, in any way, inhibit the instructional program.	4	5	5	4	4	5	27
The building does not, in any way adversely affect the learning of pupils.	5	5	5	4	5	4	28

Source: Personal interviews conducted in April and May, 1991.

TABLE 19

POINT VALUE ASSIGNMENTS FOR RESPONSES TO ALL STATEMENTS MEASURING SATISFACTION

Point Value for Responses:

Strongly Agree - 5 Agree - 4 Undecided - 3 Disagree - 2 Strongly Disagree - 1

DIVISION: Portsmouth	Central Office Administrator	Principal	Teacher A	Teacher B	Custodian	PTA Member	Total
The building meets the expectations for which it was designed.	4	5	4	5	4	4	26
The building has an adequate number of spaces to house the entire student population.	4	4	2	4	2	2	18
The building has an adequate number of spaces to accommodate the instructional program.	4	4	2	2	2	4	18
Each space of the building is of sufficient size and shape.	3	4	2	2	4	2	17
The building has adequate space for the extracurricular, athletic, and social activities of pupils.	4	4	2	5	4	4	23
The building operates as a unit with all parts located in a proper relationship so that activities be conducted efficiently, conveniently, and safely.	4	5	4	5	4	4	26
The building provides a safe and comfortable learning environment for pupils.	4	5	5	5	4	5	28
The building needs no modification.	4	4	2	2	2	2	16
The building does not, in any way, inhibit the instructional program.	4	4	4	4	4	4	24
The building does not, in any way adversely affect the learning of pupils.	4	4	5	4	4	4	25

Source: Personal interviews conducted in April and May, 1991.

TABLE 20

POINT VALUE ASSIGNMENTS FOR RESPONSES TO ALL STATEMENTS MEASURING SATISFACTION

Point Value for Responses:

Strongly Agree - 5 Agree - 4 Undecided - 3 Disagree - 2 Strongly Disagree - 1

DIVISION: Richmond	Central Office Administrator	Principal	Teacher A	Teacher B	Custodian	PTA Member	Total
The building meets the expectations for which it was designed.	5	4	4	4	5	5	27
The building has an adequate number of spaces to house the entire student population.	4	2	4	4	5	4	23
The building has an adequate number of spaces to accommodate the instructional program.	4	2	4	4	4	4	22
Each space of the building is of sufficient size and shape.	5	4	4	4	4	4	25
The building has adequate space for the extracurricular, athletic, and social activities of pupils.	5	5	4	4	5	5	28
The building operates as a unit with all parts located in a proper relationship so that activities be conducted efficiently, conveniently, and safely.	4	5	4	4	5	5	27
The building provides a safe and comfortable learning environment for pupils.	5	5	4	4	5	4	27
The building needs no modification.	2	2	2	2	4	4	16
The building does not, in any way, inhibit the instructional program.	5	5	4	4	4	4	26
The building does not, in any way adversely affect the learning of pupils.	5	5	4	4	4	4	26

Source: Personal interviews conducted in April and May, 1991.

TABLE 21

POINT VALUE ASSIGNMENTS FOR RESPONSES TO ALL STATEMENTS MEASURING SATISFACTION

Point Value for Responses:

Strongly Agree - 5 Agree - 4 Undecided - 3 Disagree - 2 Strongly Disagree - 1

DIVISION: Suffolk	Central Office Administrator	Principal	Teacher A	Teacher B	Custodian	PTA Member	Total
The building meets the expectations for which it was designed.	5	5	4	4	4	5	27
The building has an adequate number of spaces to house the entire student population.	5	4	4	5	4	4	26
The building has an adequate number of spaces to accommodate the instructional program.	5	4	4	5	4	4	26
Each space of the building is of sufficient size and shape.	5	3	4	4	4	3	23
The building has adequate space for the extracurricular, athletic, and social activities of pupils.	4	5	5	4	4	5	27
The building operates as a unit with all parts located in a proper relationship so that activities be conducted efficiently, conveniently, and safely.	5	5	2	4	4	4	24
The building provides a safe and comfortable learning environment for pupils.	5	4	5	5	4	4	27
The building needs no modification.	5	2	4	2	4	2	19
The building does not, in any way, inhibit the instructional program.	5	2	5	4	4	3	23
The building does not, in any way adversely affect the learning of pupils.	5	5	5	4	4	5	28

Source: Personal interviews conducted in April and May, 1991.

TABLE 22

POINT VALUE ASSIGNMENTS FOR RESPONSES TO ALL STATEMENTS MEASURING SATISFACTION

Point Value for Responses:

Strongly Agree - 5 Agree - 4 Undecided - 3 Disagree - 2 Strongly Disagree - 1

DIVISION: Virginia Beach	Central Office Administrator	Principal	Teacher A	Teacher B	Custodian	PTA Member	Total
The building meets the expectations for which it was designed.	5	5	4	4	4	4	26
The building has an adequate number of spaces to house the entire student population.	4	5	2	2	2	2	17
The building has an adequate number of spaces to accommodate the instructional program.	5	5	2	4	2	2	20
Each space of the building is of sufficient size and shape.	5	2	3	1	4	2	17
The building has adequate space for the extracurricular, athletic, and social activities of pupils.	5	5	2	2	4	4	22
The building operates as a unit with all parts located in a proper relationship so that activities be conducted efficiently, conveniently, and safely.	5	5	2	2	4	4	22
The building provides a safe and comfortable learning environment for pupils.	5	5	2	2	2	4	20
The building needs no modification.	5	3	2	1	2	2	15
The building does not, in any way, inhibit the instructional program.	5	4	2	2	2	3	18
The building does not, in any way adversely affect the learning of pupils.	5	5	2	2	2	4	20

Source: Personal interviews conducted in April and May, 1991.

TABLE 23

POINT VALUE ASSIGNMENTS FOR RESPONSES TO ALL STATEMENTS MEASURING SATISFACTION

Point Value for Responses:

Strongly Agree - 5 Agree - 4 Undecided - 3 Disagree - 2 Strongly Disagree - 1

DIVISION: Williamsburg	Central Office Administrator	Principal	Teacher A	Teacher B	Custodian	PTA Member	Total
The building meets the expectations for which it was designed.	4	5	5	2	4	4	24
The building has an adequate number of spaces to house the entire student population.	2	2	5	4	2	3	18
The building has an adequate number of spaces to accommodate the instructional program.	4	4	4	2	4	4	22
Each space of the building is of sufficient size and shape.	4	5	5	2	4	4	24
The building has adequate space for the extracurricular, athletic, and social activities of pupils.	4	1	5	1	4	4	19
The building operates as a unit with all parts located in a proper relationship so that activities be conducted efficiently, conveniently, and safely.	4	5	5	4	5	4	27
The building provides a safe and comfortable learning environment for pupils.	4	5	5	4	4	4	26
The building needs no modification.	4	5	5	2	3	3	22
The building does not, in any way, inhibit the instructional program.	4	5	5	2	4	4	24
The building does not, in any way adversely affect the learning of pupils.	4	5	5	2	4	4	24

Source: Personal interviews conducted in April and May, 1991.

BIBLIOGRAPHY

BIBLIOGRAPHY

Abbott, Carl. The New Urban America Growth and Politics in Sunbelt Cities. Chapel Hill: The University of North Carolina Press, 1981.

Affleck, Kristen and Brian Fuller. "The Integration of Programming and Educational Specifications," CEFP Journal (November-December, 1988): 9-12.

"America's Country Schools," Principal 65 (September, 1985): 13-17.

American School and University Architectural Portfolio (November, 1990): front cover.

Anderson, Lester W. and Lauren A. Van Dyke. Secondary School Administration. New York: Houghton Mifflin Company, 1972.

"Average Public School Building Costs," Reports supplied by the Commonwealth of Virginia, Department of Education (Reports for years 1979-1989).

Babineau, Raymond E. "Projecting Educational Programs and Planning Educational Facilities," CEFPI's Educational Facility Planner 27 (January-February, 1989): 24-27.

Barnard, Henry. School Architecture: or Contributions to the Improvement of School-Houses in the United States. New York: A. S. Barnes, 1860.

Boles, Harold. Step by Step to Better School Facilities. New York: Holt, Rinehart and Winston, Inc, 1965.

Borg, Walter R. and Meredith Damien Gall. Educational Research, Fouth Edition. New York: Longman, 1983.

Bowers, J. Howard and Charles W. Burkett. "Physical Environment Influences Related to Student Achievement, Health, Attendance and Behavior," CEFP Journal (July-August 1988): 33-34.

Brubaker,C. William. "The Impact of Technology on Educational Facilities," Educational Facility Planner 27 (November-December, 1989): 4-6.

_____. "Planning Tomorrow's Schools: Eight Trends to Shape School Design." CEFP Journal (November-December, 1988), 4-6.

Bruss, Lyle R. "Space Planning Guidelines for Elementary and Secondary Schools," Educational Facility Planner (January-February, 1989): 22-23.

Bullock, Ellis W., Jr. "Design and the Design Process," CEFP Journal (November-December, 1986): 4-5.

Castaldi, Basil. Educational Facilities, Planning, Modernization, and Management. Third Edition. Boston: Allyn and Bacon, 1987.

Caudill, William Wayne. Architecture by Team. New York, Van Nostrand Reinhold Company, 1971.

_____. Toward Better School Design. New York: F. W. Dodge Corporation, 1954.

Christopher, Gaylaird. "10 Trends for Future Educational Design," Educational Facility Planner (January-February, 1989): 15.

_____. "Does the Quality of the School Environment Affect the Quality of Our Children's Education?" CEFP Journal (July-August, 1988): 21-23.

Ciucci, Joseph, Jr., Glen Earthman, Kathryn Pearsall, Martha Phillips, and John Ziegler. Building for Energy Efficiency, ed., Herbert S. Wheary, State Office of Emergency and Energy Services, Office of Emergency and Energy Services, Richmond (December, 1983).

Cochran, Glen and Donald A. Wahl. "Research and Application Design Bivouac: A Way to Strengthen Facility Planning," CEFP Journal (September-October, 1988), 18-19.

Coleman, Donald G. "Future Facility Forecasting," Educational Facility Planner (September-October, 1989): 4-8.

County and City Data Book. U. S. Government Printing Office, U. S. Department of Commerce, Bureau of Census (May, 1988).

Damn, Jim. "Growth-Blessing or Headache," Educational Facility Planner (January-February, 1989), 15.

Davis, Jack and E. E. Loveless. The Administrator and Educational Facilities. New York: University Press of America, 1981.

Day, C. William. "Interagency Use of Public Facilities," School Business Affairs (April, 1984): 18, 44.

_____. "State-of-the-Art Facility: A Planning Process." Paper presented at the Annual Meeting of the Association of School Business Officials (September 29-October 3, 1985): ERIC, ED276096.

Development and Economy in Educational Building. A Report on the OECD Project. Organisation for Economic Co-operation and Development (December 14, 1960).

Dresslar, Fletcher B. American Schoolhouses. Washington Government Printing Office, 1911.

Dusseldorp, Ralph A., Duane E. Richardson, and Walter J. Foley. Educational Decision-Making Through Operations. Boston: Allyn and Bacon, Inc., 1971.

Earthman, Glen I. "Benefits of International Cooperative Efforts in Educational Facility Planning," CEFP Journal (September-October, 1988): 4-6.

_____. "The Role of the State Department of Education in Planning School Facilities," Educational Facility Planner (May-June, 1989): 4-6.

_____. "The View From Here," Educational Facility Planner (July-August, 1989): 2.

Englehardt, Nickolaus. Complete Guide for Planning New Schools. New York: Parker Publishing Co., 1970.

Everett, Ronald E. "Educational Specifications for Administrative and Support Areas in School Buildings: Considerations in Planning," CEFP Journal (January-February, 1986): 25-27.

Faludi, Andreas. Planning Theory. New York: Pergamon Press, 1973.

_____. A Reader in Planning Theory. New York: Pergamon Press, 1973.

Ficklen, Ellen. "This High-Tech High School Brings the 21st Century to Orlando A Little Early," The American School Board Journal (April, 1988): 34-36.

Fischer, Bill. "Still Going America's One-Room Schools," NEA Today (March, 1983): 17.

Frederickson, John H. "Writing Educational Specifications." Schoolhouse Planning (Reston: Association of School Business Officials International, 1987): 21-26.

Friedmann, John and William Alonso, eds. Regional Development and Planning. Cambridge: The MIT Press, 1964.

Fuller, Brian F. "Program Management," Educational Facility Planner (January-February, 1989): 23-24.

Glass, Thomas E. "Adapting Scheduling Programs for Educational Specifications," CEFP Journal (September-October, 1984): 22-23.

_____. "Educational Specifications: A Blueprint for the Future Program," CEFP Journal (January-February, 1986): 4-13.

Gittell, Marilyn. Participants and Participation. New York: Frederick A. Praeyer, Publishers, 1967.

Gorden, Raymond L. Interviewing Strategy, Techniques, and Tactics. Chicago: The Dorsey Press, 1987.

Goechenour, Julie. "Virginia's Smallest School Threatened," Virginia Farmer (January, 1991), 33.

Guide for Planning Educational Facilities. Ohio: Council for Educational Facilities Planners, 1971.

Guilliford, Andrew. "The One-Room School Lives," Principal (September, 1985): 6-12.

Griffin, C. W., Jr. Systems An Approach to School Construction. New York, Educational Facilities Laboratories, 1971.

Gross, Ronald, and Judith Murphy. Educational Change and Architectural Consequences. New York: Educational Facilities Laboratories, 1968.

Hathaway, Warren E. "Technology and Education: Designing Educational Facilities to Avoid Premature Obsolescence," CEFP Journal (November-December, 1988): 13-17.

Hawkins, Harold L. and Betty Lightfoot Overbaugh, "The Interface Between Facilities and Learning," CEFP Journal (July-August, 1988): 4-7.

Heatwole, Cornelius J. A History of Education in Virginia, Macmillan Co., New York, 1916.

Henderson, J. Vernon. Urban Development Theory, Fact, and Illusion. New York: Oxford University Press, 1988.

Herman, Jerry J. and Robert Hirsekorn. Administrator's Guide to School Construction, Remodeling and Maintenance. New York: Parker Publishing Co, Inc., 1975.

Hertz, Karl V. and C. William Day, eds. Schoolhouse Planning. Reston: Association of School Business Officials International, 1987.

Hill, Franklin. "Facilities Planning -- A Catalyst for Educational Technology Restructuring," CEFPI's Educational Facility Planner (November-December, 1989): 17-18.

Holmes, Natalie Carter. "Consolidate, Cooperate, Collaborate: Dilemmas of Rural Schools," The School Administrator (November, 1990): 8-15.

Honeyman, David S "A Growing Concern for School Buildings," Educational Facility Planner 27 (March-April, 1989), 4-6.

Jilk, Bruce A. "Boomers' Kids Pose New School Construction Question," The School Administrator (June, 1987): 14-15.

Johnson, Marvin R. A. The School Architect. Washington, D. C. Educational Service Bureau, Inc, 1968.

Jolivet, Anna. "Applying Interface Concepts to Facility Planning," CEFP Journal (July-August, 1988): 17-20.

Keller, Mary Ann. "Interior Design's Role in Educational Specifications, CEFP Journal (January-February, 1986): 19-20.

Kerlinger, Fred N. Foundations of Behavioral Research. New York: Holt, Rinehart and Winston, Inc. 1973.

Knezevich, Stephen J. Administration of Public Education. Third Edition. New York: Harper and Row, 1975.

Kober, Nancy. "Think Rural Means Isolated? Not When Distance Learning Reaches Into Schools." The School Administrator (November, 1990): 16-24.

Kowalski, Theodore J. Planning and Managing School Facilities. New York: Praeger, 1989.

Leu, Donald J. Planning Educational Facilities. New York: The Center for Applied Research in Education, Inc., 1965.

Lutz, Frank and Laurence Iannaccone. Public Participation in Local School Districts. Lexington: D. C. Heath, 1978.

MacKenzie, Donald G. Planning Educational Facilities. New York: University Press of America, 1989.

Managing Urban Change, Vol I. Policies and Finance. Paris. OECD, 1983.

Managing Urban Change, Vol. II, The Role of Government. Paris. OECD, 1983.

Maryland School Science Facilities Guidelines, 1977. A Publication of the Division of Instruction, Maryland State Department of Education and The Education Section, Maryland Interagency Committee on School Construction.

McQuade, Walter, ed. Schoolhouse. New York: Simon and Schuster, 1958.

Moore, H. Hugh. "Declining Enrollment Cuts New School Construction." Public Education in Virginia (Summer, 1981): 3, 21.

Muth, Richard F. Urban Economic Problems. New York: Harper and Row Publishers, 1975.

Niece, Richard. "The Impact of Environment on Teaching and Learning," NASSP Bulletin (May, 1988): 79-81.

North Carolina Public Schools Furnishing and Equipment Standards A Guide for Planning and Equipping New Facilities and Evaluating Existing Schools, North Carolina Department of Public Instruction, September, 1988.

North Carolina Public Schools Facility Standards A Guide for Planning School Facilities. North Carolina Department of Public Instruction Division of School Planning, December, 1988.

O'Connor, John W. A Study in School and University Building Design New York: Vantage Press, 1974.

Ornstein, Allan C. "How Big Should Schools and Districts Be?" Education Digest (October, 1990): 44-7.

Phillips, Joanne. "Updated Classrooms for Updated Curriculum," CEFP Journal (March-April, 1986): 8-9.

Piccigallo, Phillip R. "Renovating Urban Schools is Fundamental to Improving Them," Phi Delta Kappan (January, 1989): 402-406.

Pounds, Ralph and James Bryner. The School in American Society. New York: MacMillan Co., 1967.

Powell, Marvin. "Construction Program Management for Educational Facilities," Educational Facility Planner (January-February, 1989): 16-17.

Pratte, Richard. Contemporary Theories of Education. Scranton, Intext Educational Publisher, 1971.

Providing for Future Change Adaptability and Flexibility in School Building. Paris: Organisation for Economic Cooperation and Development, (OECD), 1976.

Puleo, Vincent T. "In Searching for More School Spaces, We Discovered the Value of Flexibility." American School Board Journal (April, 1986), 41-42.

Recent School Facility Guidelines and Requirements for Eight States, North Carolina Department of Public Instruction Division of School Planning, June, 1988.

Rondeau, Edmond P. "The Future of Facility Management." Educational Facility Planner (January-February, 1989): 9-14.

Rorer, Henry S. A History of Norfolk Public Schools, 1681- 1968. Old Dominion University, 1968.

The School Architect. Educational Service Bureau, Inc. Washington, D. C., 1968.

Schumacher, Robert C. "This School Accommodates Extra Kids and Serves Instructional Goals, Too." The American School Board Journal (April, 1986): 42-43.

Schatzmann, Inman Elsie. The Country School at Home and Abroad. The University of Chicago Press, 1942.

Schwartz, Barry. The Changing Face of the Suburbs. Chicago: The University of Chicago Press 1976.

Seaborne, Malcolm. Primary School Design. London: Routledge and Kegan Paul, 1971.

Sleeman, Phillip J. and D. M. Rockwell. Designing Learning Environments. New York: Longman, Inc., 1981.

Sloane, Eric. The Little Red Schoolhouse. New York: Doubleday and Company, Inc., 1972.

Sokol, Gerry R. "The Impact Educational Facilities Have on the Integration of Handicapped Students," Educational Facility Planner (July-August, 1989): 9-11.

Spencer, Darrell. "State Education Agencies Facility Planning Services in North Carolina," Educational Facility Planner (May-June, 1989): 10-12.

Stanard, Marilynn and H. Edward Lilley. "Designing School Facilities Cross-Culturally: Preserving Ethnic Heritage," CEFP Journal (September-October, 1988): 13-16.

Stautz, Carl H. Planning Your School Building Dollar. New York: Chilton Company, 1960.

Stenzler, Yale. "State Education Agencies: Planning Requirements," Educational Facility Planner (May-June, 1989): 7-9.

Stewart, G. Kent. "Facility Planners and Policy Development," Educational Facility Planner (March-April, 1989): 19-21.

Strevell, Wallace H. and Arvid J. Burke. Administration of the School Building Program. New York: McGraw- Hill Book Company, 1959.

Tanner, C. Kenneth and Earl J. Williams. Educational Planning and Decisionmaking. Lexington: D. C. Heath and Co., 1981.

Taylor, Lee. Urban-Rural Problems. California: Dickenson Publishing Co., Inc., 1968.

Teague, N. Reginald and C. William Day. "What Tomorrow's Classroom May Look Like," VOICE (Spring, 1989): 9-10.

Thayer, V. T. The Role of the School in American Society. Dodd, Mead, and Co., New York, 1960.

Thrasher, James M. Effective Planning for Better School Buildings. Midland, Michigan: Pendell Publishing Co., 1973.

Ward, James. "Requirements for the Code and Non-Instructional Spaces in the Educational Specifications," CEFP Journal (January-February, 1986): 23-25.

Weber, George O., ed. A Basic Manual for Physical Plant Administration. Washington, D. C.: The Association of Physical Plant Administrators, 1974.

"What Went Wrong," Maintenance and Operation Errors to Avoid in Educational Facility Planning, Council of Educational Facility Planners, Columbus, Ohio, 1968.

Whitehand, J. W. R. The Changing Face of Cities A Study of Development Cycles and Urban Form. Great Britain, Page Brothers, 1987.

Wilson, Stanley E. and James R. Schneider, "Facility Design for Transient Populations and Reuse," Educational Facility Planner (November-December, 1989): 25-27.

Wolves at the Schoolhouse Door. The Education Writers Association. Washington, D. C. 1989.

Zelip, Frank F. "Educational Specifications--Foundations for Good Buildings." Research Corporation of the Association of School Business Officials, Chicago, 1968.

_____. Guidelines for School Planning and Construction, Chicago: The Association of School Business Officials, 1968.

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