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ABSTRACT

This study determined what stakeholders using middle school facilities deemed as important characteristics for educational facilities compared to the architects' perceptions. The study compared the perceptions between 300 middle school teachers, 100 middle school principals, and 100 architects on 13 common educational facility characteristics. Results reveal all three groups had significant disagreement in their responses. Data show teachers and principals ranked instructional items; i.e., features which enhance or aid in the delivery of instruction, most important while architects ranked as most important in those areas related to design features which added to the visual impact of the facility or delivery of services within the structure. Appendices contain survey data and instrument. (Contains 63 references.) (GR)

A COMPARATIVE ANALYSIS OF THE IMPORTANCE OF MIDDLE SCHOOL BUILDING CHARACTERISTICS TO TEACHERS, PRINCIPALS, AND ARCHITECTS

By

George Kenton Miller

A dissertation submitted to the faculty of the University of North Carolina at Chapel Hill in partial fulfillment of the requirements for the degree of Doctor of Education in the School of Education

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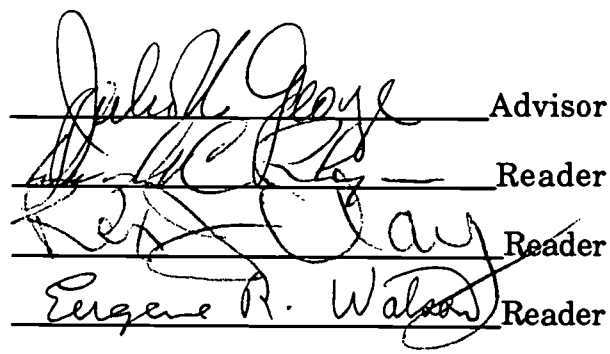

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GEORGE KENTON MILLER.
A COMPARATIVE ANALYSIS OF THE IMPORTANCE OF MIDDLE SCHOOL BUILDING CHARACTERISTICS TO TEACHERS, PRINCIPALS, AND ARCHITECTS
(Under the direction of Dr. Julio George)

ABSTRACT

This study concerns the perceptions of three important groups in the field of educational facilities planning. The three groups surveyed were 300 middle school teachers, 100 middle school principals and 100 architects randomly chosen in the state of North Carolina. A survey instrument was developed from existing literature in the area of facilities planning and design to include a general set of 13 common building categories. Respondents were asked to rank the items from least to most important. This survey instrument was validated, revised, and then administered to the three population groups. The data was analyzed for strength of disagreement and significance of any existing differences within groups. Descriptive analysis was used for between groups comparisons.

All groups showed significant differences. Teachers showed the most disagreement in their responses. Principals were second in strength of disagreement and the architect group showed least disagreement. Group responses when combined also showed significant differences. The between group differences indicated the most disagreement between teachers and architects and the least between teachers and principals. Teachers and principals ranked instructional items most important (features which enhance or aid in the delivery of instruction). Architects ranked items

related to general design most important (features which added to the visual impact of the facility or delivery of services within the structure).

Recommendations include a reassessment of the existing planning and design processes, the inclusion of teachers and principals in planning, encouragement of site based and consensus building management techniques and development of effective planning instruments. Direct contact of the planners, designers and user group was also recommended along with the allotment of adequate time for the planning process. A return to the philosophy of "form follows function" was encouraged along with several other recommendations. In conclusion the researcher challenged facilities research specialists to pursue new areas of research in this area to build a base of knowledge which this study pioneers.

Chapel Hill, 1991

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The most important thanks goes to my wife Lisa who stood by me when the days grew long and the frustration built.

George K. Miller

Statesville, N.C.

April 24, 1991

TABLE OF CONTENT

LIST OF TABLES

CHAPTER ONE

THE CONCEPTUAL FRAMEWORK

Introduction

Education has been the center of concern over the past decade. Quality of instruction has suffered ,due to weak curriculum, lack of discipline, and poor teacher preparation. These and other issues, such as low test scores, have been of interest throughout the United States. Many states, taking these issues as top priorities, have developed comprehensive education reform to attack the problems.

In North Carolina the problems have been addressed in the Basic Education Plan or BEP and more recently Senate Bill 2. The BEP has addressed the curriculum problem by standardizing a minimum course of study to be used throughout the state. Also addressed by the BEP is the issue of adequate personnel and resources to implement the goals it established. (Basic Education Plan, 1984)

A decentralization of power in favor of more teacher input into the education process is beginning.(Senate Bill 2,1989) The BEP is a phased approach which decreases class sizes, increases staffing and support personnel, expands and adds new programs, and establishes a basic curriculum. (Basic Education Plan, 1984).

Existing physical plants, with minor modifications, are expected to absorb reform generated pressures on facilities. These pressures are in addition to the usual demographic changes, consolidation issues , new building programs, rebuilding of the education infrastructure, and professionalizing of the teacher workspace.

Senate Bill 2 emphasizes that the teachers who occupy and use school facilities are to be education professionals. Educators will be held accountable, be given decision-making input and have more autonomy in an effort to bring the decision-making down to a lower level on the hierarchy of educational organization (Senate Bill 2, 1989).

With the resulting changes in education has come an emphasis on teacher professionalism and accountability (Senate Bill 2, 1989). Education needs to ajust often in response to educational demands both in process and in setting. In order to facilitate such change, a body of knowledge must be developed about the area of concern. Little if any information exists on what the teacher really feels about their workspace and its ability to successfully help the teacher implement the educational program.

The history of the facilities, or structures which house education programs, has seen some creative ideas on school design. For the most part, however,the traditional school building and its antecedent characteristics has prevailed for almost 150 years.(Castaldi, 1969) Little has been done to determine the relative importance of particular facilities characteristics to the teachers and principals who actually must use this space to reach the educational goals established.

Historically educational spaces have been studied for their effect on learning, cost efficiency, utility or energy efficiency. Professionalization of the workspace was the least likely reason to choose particular

characteristics. Researchers are beginning to discover that the immediate physical environment has great influence on organizational life within the school (Human Needs and Working Places, 1972).

Most states have a detailed process by which facilities are planned and built. This process is referred to as the Education Specifications Process in North Carolina by the NorthCarolina Division of Planning, Raleigh. An important part of the process is to have the clientele involved in the design and planning of a new school or addition. Even the N.C. Division of Planning believes this is not done in most cases. Rarely does the process include the teacher or principal to the extent it should. It is usually left up to the local board and superintendent to choose the process for determining construction characteristics and design.(McClurkin,1964)

The tendency, according to the N.C. Division of Planning, is for the local board to hire an architectural firm to write the "Educational Specifications" (what needs to be in the structure). Teachers and principals who will work in these spaces are only sporadically given input into the process. As a result, the spaces built emphasize the learning environment of the pupil or the cost effectiveness and utility of architects and school boards.

Purpose

We must develop a body of knowledge about what those experts using the facility everyday deem as important characteristics for educational facilities to have and how these important characteristics compare with architects' perceptions. The human needs of the working spaces have often been overlooked in the design process. The need for this knowledge base is apparent.

It is the purpose of this study to help in the development of this body of knowledge about the comparative perceptions of the three groups chosen. Teaching is a complex and detailed process and teachers and principals using the facilities on a day-to-day basis should know best what is needed in the facility to achieve the process of meeting our educational goals. If we expect educators to perform as professionals and be accountable for their product, then we must develop a professional work environment in addition to that needed to perform the task goals established.

Procedure

This study is designed to examine the perceptions of middle school teachers, middle school principals and architects in regard to a set of building characteristics for a middle school. The study will compare importance ratings given by each group of respondents to the various characteristics to determine if any significant differences exist. The comparison of the similarities and differences of the group opinions, of middle school building characteristics, will be used to answer five research questions. These questions are:

1. How do teachers rank, by category, the importance of items related to building characteristics? Do teachers differ significantly in the way they rank those items?

2. How do principals rank, by category, the importance of items related to building characteristics? Do principals differ significantly in the way they rank those items?

3. How do architects rank by category the importance of items related to building characteristics? Do architects differ significantly in the way they rank those items?

4. How does each respondent group rank the 13 building characteristics categories in summary categories 14 and 15 in order of importance? Are there significant within group

differences in the way teachers, principals, and architects rank these building categories?

5. When the rankings of teachers, principals and architects, for the same set of middle school building characteristics, are combined are there significant within group differences?

Gathering the data necessary to answer the research questions will be accomplished through the survey method of data collection using a rank order checklist. Castaldi (1969) found the school survey to offer a promising way for determining the extent to which our schools are meeting our nation's needs and what we must do to help create the best possible atmosphere to implement the goals of education. Responses to the survey questions indicate the relative importance of different school building characteristics to each subject group. The subjects within each group were chosen using random sampling techniques to increase validity of the data.

The focus of the research questions is the importance ratings of various middle school building characteristics. The study is an effort to provide insight into how the planning process for new schools might be improved. The results may be important to the future revision of educational design specifications and the process through which they are written.

It is believed by the researcher that the study may also impact the professionalization of education (The Holmes Report, 1986). The study, by focusing on the perceptions of these major participants in school planning, points to areas of major concern for the subject groups. These may be dissatisfiers in the work place and create barriers to collegiality and a professional orientation within education.

Organization of the Study

Chapter 1 is an overview of the study and presentation of the research questions to be addressed. Chapter 2 contains a review of the literature related to school facilities design and school planning. It establishes a historical framework and addresses current developments in the field. A discussion of current reform and its impact is also discussed in this chapter. Chapter 3 explains the rationale for use of the particular procedures of the study and describes the methodology to be employed. Chapter 4 presents the results of the survey and an analysis of the data as they relate to the research questions. Chapter 5 concludes the study with a summary, conclusions and recommendations of the study. Four Appendix sections contain data tables, examples of correspondence, the survey instrument and field test data for reliability checks.

CHAPTER TWO

LITERATURE REVIEW

Overview

The literature available indicates a lack of information about the teacher or principal's role in the school facilities planning process. The focus of most studies involves specific design considerations with particular emphasis on the architectural innovations or quantitative aspects (square footage, number of classrooms, etc) of the facility. Preliminary examination of school planning literature, including a computer assisted search of the ERIC system and Dissertation Abstracts International has supported the lack of information about the similarities and differences of opinions of teachers, principals, and architects relative to school design.

This architectural bias in the literature results in a loss of the teacher and principal as key players in the facility design process. Without these key role players, the facilities which result from most planning processes are devoid of the needs and expectations of those who will be asked to design and implement instructional programs in them (teachers and principal).

The primary descriptors for this study will involve building characteristics for school facilities and their impact on education. Also

important to this study will be the planning process as it relates to teachers and principals.

The researcher will conduct a review of the literature using the key descriptors. A synthesis of school design considerations will be developed from the literature. A framework for questions on a survey instrument to be used in the study will be developed. To illustrate the probability that teachers and other education professionals will become more involved in the design and planning of new schools,citations relating to the school reform movement will also be used.

Historical Perspective

Throughout the history of this country, school buildings have reflected societal values and changing educational trends. Steele (1973) suggests that "All the physical facilities of an organization make a statement about the nature of that social system. The facilities are a physical record of the choices that managers have made about how to shape the system and what to have around it" (p. 45). With the emergence of the idea of universal education for all, or the public school in the late 18th century and early 19th century, a new dimension in education began.

In the early 1800's, the changes associated with the industrial revolution, involving movement from a rural to more urban society, began to create national sentiment for a free public educational system (Leu, 1965). Thomas Jefferson played a major role in the public school movement when he proposed, to the Virginia Assembly of 1779, a system of free public elementary schools. While Jefferson's proposal was enacted, it laid the foundation on which the community school district of today was based (Campbell, Cunningham, Nystrand, Usdan, 1985).

In the early 1800's, the movement began for the state education agencies to give more direction to the local education agencies on school facility planning and to regulate in detail the design, construction , location, and use of school facilities. Three periods usually delineate this movements' development: 1800's to early 1900's-- the need for school facility control by the state was established; early 1900's to middle 1900's-- the state assumed regulatory functions for the design, construction, and maintenance of school facilities; and, middle 1900's to present-- the state expanded its role to include service related functions or functions relating to information and directions on school facility areas, and an increase in its regulatory functions.

1800's to Early 1900's

American schools tended to be either private or church affiliated in the 17th and 18th centuries (Campbell; Cunningham; Nystrand; Usdan; 1985). Castaldi (1969) described the schools of this period as simple and utilitarian, failing to attract the attention of architects (Castaldi, 1969 p.8).

The one room school, typically of log or frame construction, was the standard facility during colonial times and through much of the early 19th century. It was usually a multifunction facility serving as a teacher's home, school, and community center (Leu, 1965). Though flexible, the one room schoolhouse proved poorly suited for the purpose of educating children.

William A. Alcott in 1831 described the typical American school as follows:

> "Few, indeed, of the numerous school houses in this country are well-lighted. Fewer still are painted, even outside. Playgrounds for common school's are scarcely known. There is much suffering from the altercation of heat and cold and from smoke. The feet of children have even sometimes been frozen. Too many pupils are confined to a single desk or bench where they are constantly jostling or otherwise disturbing each other. The construction of desks and benches is often bad. Little or no provision is made for free ventilation. Hundreds of rooms are so small that the pupils have not more than five or six square feet of surface each. Here they are obliged to sit, breathing impure air, on benches often not more than six or eight inches wide and without backs." (Council of Educational Facilities Planners Guide, P. 3)

The inability of the local school districts to provide adequate housing for students was noted as early as 1837 by Horace Mann, Secretary of the Board of Education of Massachusetts. A portion of his First Annual Report in 1838 was devoted to "the construction, condition, and number of schoolhouses" in Massachusetts. (p. 389)

Recognizing the importance of the need for more direction from the state level, Mann also included a supplementary report. This report made recommendations with regard to ventilation and warming, size, desks and seats, location of school houses, light and windows, yards or playgrounds, and the duty of instructors in relation to schoolhouses (pp. 433-488).

The Quincy Grammar School was constructed in Boston in 1848. In its day, it was a state of the art facility marking a new era in school construction. The Quincy School contained twelve classrooms, an assembly hall, and a principal's office. It was four stories high and designed to serve 660 students. Fifty- five students were crowded into each classroom and sat in fixed individual seats. Modern amenities included toilet rooms and a

heating plant, both located in the basement of the school (Leu, 1965). This school became the prototype for school construction

Morisseau (1972) indicates that the Quincy School is recognized as the first school in which students were divided by age, arranged into equal size groups, and assigned to a separate classroom. The pupil teacher ratio was related to the organizational structure as seen in the following quote from Morisseau:

> "Behind this departure from the multi-age groupings of the one-room school house was an educational philosophy premised on the self-contained classroom, in which one teacher guided the learning of groups ranging from 20 to as many as 60 pupils, the pupil-teacher ratio depending on the ability and willingness of the community to pay for education." (p. 6)

Improvement of design and construction techniques occurred from the mid-1800's through the 1920's. These improvements paralleled changes in school organizational patterns and educational programs (Boles, 1965). This period was characterized by extensive use of ornamentation, high ceilings and parapet walls. These architectural trends gave way to a more austere approach to designing schools in the 1930's.

Early to Mid 1900's

Concerns by educators and legislators for the deplorable conditions of schools gradually brought about more state control over school facilities. In order for the state to exercise such controls, building codes were developed at the state level and personnel hired to enforce these codes (Cubberly and Elliott, 1915).

The need for personnel at the state level to enforce school building codes led to the establishment of separate school plant service units in the early 1900's. Among the first of the southeastern states to establish units were North Carolina in 1917, Alabama in 1919, Georgia in 1923 and Arkansas in 1924 (Hutcheson, 1962).

Even with the establishment of state school plant units, very little construction of school facilities slightly following the war (1922-1928) , but beginning in 1929, the depression slowed progress again. The Civil Works Administration (CWA) and the Public Works Administration (PWA) from 1934- 1938 increased the per pupil funding available for construction and improved existing school buildings (Campbell, Cunningham, Nystrand, Usdan, 1985). This marked the first steps by the federal government with regard to school buildings (Thurston and Roe, 1957).

The depression that devastated the national economy created a need to build schools more economically. The result was simple, box-like construction, free of aesthetic embellishments (Leu, 1965). In the years just before WWII, school facilities and architectural styles continued to be unimaginative. The main concern during this period focused on uniform subdivision of spaces. Little consideration was given to the functions taking place within the facility (Castaldi, 1977).

Mid 1900's to Present

Following WWII, educational function began to take a more prominent role in the guidance of school design. This attention to function was promoted by a growing body of literature about educational facilities

planning. The Educational Facilities Laboratory was established in 1958 and began to emphasize less traditional school designs and more innovative designs. In the 1960's the American Institute of Architects became more active promoting new developments in school design (McClurkin, 1964).

Boles (1965) points out that school facilities improvement brought with it the realization that there was a relationship between learning and the physical environment of the school. Great educational reforms of the late 1800's and early 1900's stimulated the new design of school facilities. These centered around program innovations such as the graded school, high school, kindergarten, physical education and even vocational education. Higher standardsfor school construction were instituted during the 1940's. Schools of the early 1950's began to include lunchrooms, shops, libraries, gyms, and a new effort toward economy in construction.

The period of the 1970's and 1980's brought changes in the facilities needs of most school districts in the United States. The baby boom of the post war era began to decline,reducing the need for construction of new schools (Campbell, Cunningham, Nystrand, Usdan, 1985). Reduction in the number of school districts, program cutbacks, and fiscal uncertainties caused limited activity in the area of school planning during this period. This inactivity is reflected by the lack of literature on school design produced during the 1970's and 1980's.

Castaldi (1987) emphasized that standards for school sites, classroom size, special classrooms, acoustics, lighting levels, and aesthetics have developed as facilities of the 1980's emerged to provide for modern comprehensive school programs. Thus the American schoolhouse has evolved from a small one room log or frame structure in the 1800's to the multi-room building of the 1920's, and finally, to the comprehensive

the multi-room building of the 1920's, and finally, to the comprehensive school facility of the 1970's and 1980's.

Facilities and the Educational Process

Castaldi further identified the role of facilities as a basic ingredient in the education process. A school building is an educational tool capable of supporting a wide variety of learning experiences, and as such, we must consider the various aspects of this tool and its impact on the teaching-learning process. As Castaldi states: "school buildings are regarded as educational tools designed to facilitate, promote and stimulate the educational program" (p.130). Actually, school buildings sometimes possess physical characteristics that impose severe restrictions on the educational program (Castaldi, 1987 p. 130).

Castaldi (1977) emphasized the need for creativity in school design. He offered five ways to determine if creativity was involved in the design of new or renovated facilities as paraphrased below:

(1) the solution involved a novel or ingenious use of materials;

(2) the solution successfully combined aesthetics with function;

(3) the design contributed to the efficient and effective use of space;

(4) the technological advances if teaching aids were used in the design;

(5) the architect used the principles of economy, function, and operational efficiency.

Every educational facility should be designed to support, stimulate, and strengthen learning. At one time, there were basically two types of schools, the grammar school (grades 1-8) and the high school (grades 9-12). After WWI, the junior high school (grades 7-9) emerged to meet the educational needs of the 1920's. In recent years, another type of school has

developed, the middle school, housing grades 5-8 in most instances. Under this grade grouping, the elementary schools become neighborhood units serving K-4. The middle school is a transitional phase emphasizing the uniqueness of the learner in the critical years of a child's development. As Castaldi (1987) indicates, it is not what one calls a school, or what grade organization is chosen which determines educational quality. It is the effective interaction of students and teachers which really counts.

Castaldi saw the middle school as a uniquely designed facility. It is not, as many have erroneously concluded, a substitute for the upper elementary or lower high school levels. Many middle schools are housed in old high school or elementary school facilities. The middle school is an excellent starting point for change. It is just taking for and thus is still flexible and sensitive to the needs of modern education.

Trotter, Jr. and Troutman, concluded in a study of state school plant units in 1968 that a model unit should observe certain principles some of which are paraphrased below:

1. The state education agency should assure educationally functional facilities within its boundaries.
2. Minimal state regulation is essential to the provision of adequate educational facilities.
3. It is necessary to assign priorities and establish direction for the educational facilities planning services provided.
4. Services provided should relate to and center around the planning process.
5. Any planning that deals with educational facilities must be executed within the context of the total community.
6. A major element of the educational planning for a specific facility is comprehensive curriculum planning.

7. State education agency facilities planning personnel must function in a consulting role.

8. Facilities planning personnel must be aware of and make extensive use of facilities planning expertise, wherever it is found.

9. The facilities planning services provided by a state education agency need to include follow-up and evaluative services.

10. The planning section should concern themselves only with responsibilities directly related to the functional planning process.

11. The facilities planning section is responsible for providing maintenance and operations services.

Reed, based upon a survey conducted in 1975 of superintendents of local education agencies in North Carolina, made several suggestions relating to facility planning. These are paraphrased as follows:

1. The state should publish a state approved list of architects.

2. Funds should be provided local units for long- range planning and for supervisors of construction of school buildings.

3. Increased personnel would provide broader and"on-site" services.

4. The State should have "standardized" plans on file.

5. The State should provide more engineering input in the planning of school buildings to guard against poorly designed buildings.

6. The State should publish materials annually on current practices in planning and designing school buildings.

Education Specifications Process

It is ineffective today to consider facility needs in any context except through the use of a planning model that brings in the most up-to-date techniques. McClurkin (1964) stated that existing facilities may be evaluated by accepted standards of quality, age, and condition. When a

school system undertakes a system-wide school building survey, it should include: (1) a community analysis in terms of tax base, economy, and general support for schools; (2) student population studies with a spot map and projected enrollment using the survival retention ratio methods of calculation; (3) a review of the school organization pattern showing the present organization and any future plans; (4) collection of building utilization data; and (5) initiation of a study of existing facilities and evaluate them as specified in an organized and systemic manner, such as a school survey.

Castaldi (1987) underscored the importance of the school survey as the "sine quo non of educational planning. No school district can plan intelligently for its future without first making a survey of its school system." (p.89). The school survey is an essential element to sound educational planning.

J. Clark Davis (1973) sees the educational specifications process as an important one with the goal of making great teaching possible because it is one of the instruments necessary in the execution of the educational program. In other words the curriculum finds its physical expression in the construction and organization of the school plant

Davis makes the point that:

> "Preconceived notions of a school board or an architect on form and style in architecture may produce an attractive but inflexible structure from an educational point of view. The architect sets out to design a building in the classical or perhaps the modern tradition, but neglects the program implication. A minimum of people are involved in this approach. The design is set and the architect prepares it". (p.22)

A typical survey team for the North Carolina Department of Public Instruction is composed of: three school system superintendents, a school principal, a State Department engineer, a State Department educational consultant, and a project director from the Division of School Planning. The classroom teacher is not included in this team of experts (North Carolina Department of Public Instruction, Lincoln County School Survey Report, 1983). Cooperative planning may be discussed, but at present it is simply discussed.

The idea that architects and school personnel should be involved in cooperative planning of educational facilities is timely and has powerful implications in the modern educational setting.

Current management techniques and approaches, along with more recent reform movements in education, demand close attention to the opinions and perspectives of those who will deliver educational services. As Hoy and Miskel (1987) indicate, the notion that those people who work within an organization should be closely involved in decisions affecting that organization may seem to be a simple and logical proposition. It is not so simple and has developed only after decades of investigation into the areas of organizational structure, leadership, and management.

Wynn and Guditus (1984) suggest that modern technology, new demographic patterns, and socio-political changes have created changes in people's attitudes and expectations. They suggest that these changes are especially notable in the work settings, and that increasingly people want to gain more control and influence in those areas of activity which affect their jobs.(p. 47)

Organizational management specialists such as Peter Drucker, James Stoner, Peters and Waterman, Beck and Hillmar, and others

indicate group decisions tend to be better than individual decisions. They argue that group cohesiveness and group performance are usually enhanced when individuals work together to develop decisions or solutions to problems. The recurring theme in the fields of management, leadership and organization reveals that those members of an organization who are responsible for delivery of a service or product should be closely involved in decisions about how the work should be accomplished. This participation in decisions about how the work should be accomplished makes the organization members "owners" of the decisions, and in turn, the facility. This ownership promotes a commitment to organizational goals and a strong desire to achieve those goals (Lewis, 1986).

The problems facing the architect are apparent. The design he envisions must be useful as well as an expression of his artistry. It must be practical yet be able to withstand whatever the elements have to hurl at it during the next 50-75 years. In addition, it must stand up under the abuse of young learners, and in so doing, retain and maintain its educational environment. Designing functional, adaptive and aesthetically pleasing school facilities is indeed a major architectural challenge.

One of the primary responsibilities of the architect is to design well. Bruce Allsopp's 1977 book A Modern Theory of Architecture is about designing well and taking into account the requirements of people who use the structure in so far as they affect the design.

Allsopp (1977) sees the architect or designer faced with many special decisions regardless of the type of structure to be built. These decisions may be collective or individual, but are derived from the architects own perception and understanding of the needs and wants of the client group. The success or failure of decisions hinge on a number of external forces

including social, structural, climate, cultural, and economic. Of these, the cultural is most important to Allsopp because it embodies what is acceptable to the community.

Modern architecture, according to Allsopp, has tried to impose rather than understand and interpret. Allsopp feels that: "The architect is a servant not an authority"(p. 6). Much of the anonymity of modern architecture results from the anonymity of the client. The client must really exist for the design process to work. This is why so much government sponsored architecture is bad; there is no real client. The starting point is people. What do they want ? What will they enjoy? Coinciding with such questions is the architect's suppression of himself. He must surrender to his subject, his program, his people. A decision or design based on false information leads to misunderstandings, mistakes, and, ultimately, bad designs.

Davis (1973) argues that to go beyond the mere arranging of desired instructional spaces as perceived by the school board and the architect, there must be a profound change in the attitude and approaches used. A key factor in this change will be the development of educational specifications as a prelude to architectural design. Stipulation of educational specifications is a far cry from actually preparing them. Many sources of difficulty exist in preparing them. Translating what is taught and how it is to be related to space requirements, special conditions, or physical proportions can be frustrating.

A key problem stems from the fact that those who have primary responsibility for the planning and construction are far from the learning situation (school boards, superintendents, central office planners, and architects). The fact that these individuals may have at one time gone to

school or actually taught is not enough to attain expertise in all areas of teaching. Davis feels that the best educational specifications are those derived from those who will be users of the finished structure (Davis, 1973 p. 25).

James Holt in the Learning Environment 1975 discusses the role of the user in the design and planning process. He contends that the users can in only rare cases really design their own buildings, but they have an immense impact on the way the design is finally worked out. People know what they need and like, although they may not know how to get it. Those characteristics which are important to them; light, privacy, communication, quiet, company, color, storage, etc., they know well. They also know what they do not like; drab, depressing, dull, noisy, inflexible, cold, etc., spaces.

Knowing what is important may not be the answer, according to Holt. These characteristics must be translated into solutions to educational problems or goals. If users are presented with a number of solutions they are usually able to select the best alternative to meet their needs. The point is that user involvement can dramatically influence educational design if the right circumstances are created for such input. (David and Wright, 1975)

MacKenzie (1989) and other contemporary planning specialist are placing emphasis on needs assessments well in advance of the actual designing process. They also advocate the provision of a multi-purpose, educational facility providing space for community wide educational activities instead of a school that serves a select population for only a part of the day or part of the year.

The primary purpose of educational specifications is to serve as a guide to the development of sketches, plans, layouts, designs, and architectural specifications for a new school facility, addition, or remodeling. MacConnell (1957), a renowned educational facility consultant, stated in his book Planning for School Buildings :

> "Perhaps the weakest link between planning and building is interpreting the needs of those using the completed facilities. This problem of interpreting demands a fresh approach to school planning- a formulation of a systematic procedure for designing facilities for schools. To accomplish a functional and economical school design, facts are needed concerning the school program during the initial planning stage. The proposed procedure is, in essence, a fact finding process- a cooperative task of educators, students, and lay people to analyze, describe, and interpret the program so that it can become the base for the architect's decisions. The program materials prepared for these purposes are the educational specifications." (p. 89)

David and Wright (1975) contend that the physical or man made aspect of the learning environment is of critical importance. This aspect, it is argued, has been overlooked when studying the learning environment. Educators and designers have not looked closely enough at the influence of the physical environment on the learning process and the people who inhabit the places we call the learning environment.

David and Wright further contend that the thrust of research about the learning environment should be toward identifying and describing the properties of specific physical environment settings. They see the design and arrangement of furniture as major factors in implementing or impeding educational goals.

McClurkin (1964) emphasized that the evaluation of existing facilities should consider standards that are well known and widely accepted. The basic nature of these standards has changed little in the past sixty years, because the basic criteria for adequacy have remained constant over the years. These criteria include minimum classroom size, sanitation requirements, electrical requirements, acreage , etc. based on projected enrollment.

Kowalski (1989) projected ten characteristics that a quality educational facility should have as a result of astute planning. These have been identified by many experts as desirable for all educational facilities. They are paraphrased as follows:

1. Flexibility or ability of the structural system to allow for interior changes to meet demands.
2. Adaptability or the use of space for various activities.
3. Expansibility or the provision for adding on in a logical manner, looking natural and not tacked on.
4. Functional or congruency with the educational specifications.
5. Efficiency or the cost of operation and maintenance.
6. Adequacy or adequate space for the school program .
7. Suitability of the facility. Stimulating, bright with the equipment fitting the operation of the school.
8. Economy or the original investment (cost).
9. Aesthetics include the design, color, site, materials, and landscaping.
10. Identity or looking like a place of learning.

Leu (1965) points out "that general design principles commonly accepted as important in school design are: safety, health, educational

adequacy, economy, flexibility, expansibility and aesthetics". He believes that it is important to balance all factors to achieve the best school design. Leu includes the following as major design considerations:

1.Various grade level classrooms
2.Instructional materials central storage
3.Central administrative area
4.Health room
5.Multipurpose room
6.Storage spaces
7.Teacher's rooms
8.Separate custodial and mechanical areas
9.Open spaces for circulation
10.Illumination criteria
11.Aesthetically pleasing facility
12.Health and Physical Education Area
13.Space for the Performing Arts
14.General Service Areas

McClurkin (1964) suggests that educational specifications "serve to clarify and solidify the educational concepts of the staff" (p. 77). While McClurkin acknowledges that a standardized form and content for a facility has not been developed, there are considerations which should be addressed when developing educational specifications. Included in these are:

1.Attendance Area

2.Traffic

3.Organization of activities by grade, class or subject

4.Location and arrangement of spaces

5.Required storage

6.Administrative area

7.Multipurpose area

8.Food service

9.Gymnasium

10.Special Utilities and Service Areas

11.Circulation patterns

12.Environmental control

13.Acoustics

14.Custodial and Housekeeping Areas

15.Mechanical systems

16.Floor surfaces

17.Landscaping and grounds

18.Furnishings

19.Plans for utilization other than school day

20.General structure (Height, Layout, Materials, Special Features)

Engelhardt (1970) discusses in detail the many aspects of the school structure. He has an outlook that is progressive and innovative. Media centers, auditoriums, special needs areas, technology, flexible classrooms,

the arts , health and physical education needs, site selection, professional space, service areas, including parking, are discussed in detail as to the characteristics available. An important aspect of Engelhardt's book is the source of these ideas, practices, and plans. Those selected resulted from discussions with thousands of teachers and administrators about aspects of the school structure

The preceding discussion illustrates that some building considerations are commonly recognized as important by authors in the field of school planning. The survey instrument developed for this study drew heavily on the consensus of the literature about which school considerations should be given attention.

Pearson (1972), in his book, Trends in School Design, 1972 discusses the importance of the physical environment. He believes that the emotional reaction to the general character of the space is as strong as the physical reactions to the standards of warmth, light, sound, and air movement. Such emotional reactions are a subjective matter and, therefore, not strictly within the realms of architecture. However, such characteristics often determine the quality of communications between the users of the school space. Concentration on the harmonious whole design of schools should be of primary concern. The school facility from Pearson's perspective should be set within its natural landscape in such a way that the inter-relationship of outside and inside offers the most diverse possible educational opportunities for children.

Architects in the past have gone no further than producing the same all-purpose clinical space for the education of students. These schools bear all the characteristics of impersonal institutionalized structures. Architects must move away from this bureaucratic mindset. Sensitive

architects may impart on the educational space a particular character depending on the goal of education. They may impart privacy for quiet study areas; intimacy for quiet group listening; workmanlike and messy spaces; and clinical spaces to cope with noise etc.

The color, texture and furnishings of the walls; the cold, warmth or hardness of floors; carpets, rugs; tables to read and write at, and working surfaces for many kinds of jobs; and chairs, stools and bench seating, hard and upholstered, for adults as well as children. All of these contribute to the quality and character of the environment.

The Office of Education and Curriculum Development report of 1975 entitled, "Industrialized Building for Schools" concluded that the most thorough investigation, of facilities capabilities and the educational requirements they will have to meet, must be made before a new facility is to be designed.

Buttenweiser (1973), in his book, The Greening of the High School, argues that all learning is situational. It happens at a specific time and place with real people interacting. Its existence depends on a budget which must survive complex and contradictory pressures. Most important, the forms of instruction, content, physical facility, resources etc. are wholly contingent upon the quality of vision the local people possess. What works in Charlotte may not work in either Manteo or Murphy.

The basic task of the school planners, then, is to create decision-making strategies which involve the real users of an educational facility including the students, teachers, principal and the whole array of citizens who must pay for the facility. Planners should do more than just plan. They should lead by inspiring the users to a vision of what the schools can be, not merely what they ought to be. Only by direct, continual involvement with

the users, according to Buttenweiser (1973) will planners have the opportunity for such leadership.

Kowalski (1989) sees an often overlooked trend in the literature as the movement known as "teacher empowerment". This movement is striving to create more autonomy for teachers in many educational areas. If successful, teachers will demand participation in school facility planning to a greater extent than has been true in the past. Planners and architects who accept the concept of participatory planning and who, by experience, can evidence success with this mode of decision-making are apt to have a distinct advantage in the future. Those who respect the right of teachers as professionals to participate in the process and who recognize the potential contributions to quality facility design will be on the cutting edge of facility design and planning in the future. Kowalski sees teacher participation as generating conflict during planning, but it is likely to produce more effective educational facilities and learning spaces.

Reform

Since the early 1980's, American education has been involved in reform. These reform efforts began with A Nation at Risk; The Imperative for Educational Reform prepared by The National Commission on Excellence in Education, 1983. It was evident from this landmark report that American education was in crisis. It was also evident that the public understood the primary importance of education and were willing to support the reform and restructuring of education in the United States. The conclusion that declines in American educational performance were the result of disturbing inadequacies in the way the educational process itself is often conducted did not delve into the specific reasons for these

inadequacies nor specific solutions to these problems. General recommendations in the four areas of content, expectations, time, and teaching were the primary focus of this report.

A Nation at Risk marked the beginning of the most recent reform movement in education which we continue to define and implement. It acted as a catalyst for change throughout the United States.The next piece of national reform literature was the Carnegie Forum Report (1986) entitled, A Nation Prepared, which addressed teaching. The implication of this report was that a transformation of the environment for teaching from a bureaucratic authority base to a more collegial and professionally competent model was needed. Site based management, teacher autonomy, and professionalization were key elements of the Carnegie Report. The following quote from the Carnegie Report (1986) illustrates this position.

> "Because professionals themselves are expected to have the expertise they need to do their work, organizations that employ professionals are not typically based on the authority of supervisors, but rather on collegial relationships among professionals. This does not mean that no one is in charge, but it does mean that people practicing their profession decide what is to be done and how it is to be done within the constraints imposed by the larger goals of the organization.
> Work in such organizations is often challenging and fulfilling. A large body of research shows that it is these conditions of work, at least as much as the high salaries that typically accompany it, that attract our most able college graduates.
> The conditions we have just described are rarely found in schools. Teachers work in an environment suffused with bureaucracy. Rules made by others govern their behavior at every turn. Perceptive researchers have told us for years that teachers are treated as if they have no experience worth having. The text and the scope-and-sequence of the curriculum define in detail what they are supposed to teach. Decisions made

> by curriculum supervisors, teacher training experts, outside consultants and authors of teachers' guides determine how a teacher is to teach. Teachers who choose to work together as professional colleagues must constantly fight the natural tendencies of a system based on very different principles. And an endless array of policies succeed in constraining the exercise of the teacher's independent judgment on almost every matter of moment." (p. 39)

The Task Force proposed fundamental changes in the organization and structure of schools in the United States. The restructuring addressed many components of teaching including: the teacher training process, teaching standards, incentives, compensation and the decision-making process.

A third major national report was the Holmes Report (1986). The focus of this report was the professionalization of teaching. It also started to address the issue of the school environment. The Holmes group observed that "the existing structure of schools, the current working conditions of teachers, and the current division of authority between administrators and teachers are seriously out of step with the requirements of the new profession" (p.67).

The Holmes Group began an analysis of teacher education in the United States in 1983. This group, composed of deans and chief academic officers from institutions of higher education representing the fifty states, examined problems and proposed solutions relative to teacher training programs and teacher effectiveness. Their suggestions and findings were published in their 1986 report, Tomorrows Teachers. These included:

1. Improving academic preparation of teachers
2. Developing career ladders as part of the licensing of teachers

3. Creating standards for entry into the teaching profession

4. Promoting a closer relationship between teacher training institutions and schools

5. Minimizing the bureaucratic nature of schools and promoting professional autonomy for teachers (Holmes Group, 1986).

In 1985, the nation's governors took action toward implementing the recommendations made in the reform reports. They divided into seven task forces to examine extensively american education and develop a five year improvement plan. The 1991 Governors' Report: Time for Results supported many of the recommendations made in earlier reports relating to educational reform. Emphasis was placed on the importance of restructuring schools and using the leadership potential of educators to produce effective schooling. The governors stated that: "to restructure schools, we must use what we know from research about effective schools and effective leadership" (Governors Report, 1986 p. 4).

The 1991 Governors Report was important in two key areas. First, the report indicates the widespread sentiment for educational reform throughout the United States. Secondly, the report demonstrates a commitment by governmental leaders to support the reform movement. The implication is that governors will become advocates for educational reform in the political arena.

The states have begun to take up the banner on educational reform. The Basic Education Plan (1984) and Senate Bill 2 (1989) are two such pieces of legislation passed to facilitate the goal of educational reform in North Carolina. Both addressed issues identified in the national reform literature.

The educational reform movement is promoting greater involvement of teachers in the decision-making process. Senate Bill 2 represents an attempt to decentralize decision-making in favor of site-based management. It also seeks to make those involved more accountable. Teacher empowerment will demand the inclusion of teachers in the planning process for facilities. In conjunction with the recognition of the professional expertise of school-level employees, there is an emphasis on developing a professional work environment in schools.

Kowalski (1989) sees America facing a school facility dilemma extending from the college level to the pre-school program. School buildings are in need of repair or replacement at a most inopportune time. A recent study conducted by the Education Writers Association (Lewis, 1989 on the nation's public school buildings, found many significant facts about school facilities. These are paraphrased below:

1. Only 6 percent of the nation's public schools have been built since 1980.
2. At least 50 percent of the current facilities were built during the 1950's and 1960's.
3. Many schools built in the 50's and 60's used cheap materials and fast construction methods giving many of these buildings life-spans of only about 30 years.
4. Maintenance and repair budgets are usually the first items to get cut when budgets are tight.
5. Forty-three percent of the nation's schools are obsolete.
6. Forty-two percent have environmental hazards.
7. Twenty-five percent are overcrowded.
8. Thirteen percent are structurally unsound.

The implications for facilities design should be evident. Virtually all architects agree that new concepts will emerge with respect to school design and planning. Effective design and planning depend on up-to-date information about what is occurring in school design and what is important to the client group. Analysts are linking the various issues of school reform with school facilities (Kowalski, 1989). Piccigallo (1989) also notes how the terrible conditions of the New York City schools' facilities serve as barriers to the improvement of instruction. Estimates to renovate New York City schools are 4.2 billion dollars over the next decade.

It is not just the inner cities or urban areas which are in need of reform in the facilities area, because outdated or unacceptable facilities also exist in the suburbs, small towns, and rural areas. As reform brings about change in the nature of schooling, school facility renovation and replacement will emerge as an equally critical issue. Planners and designers will be unable to escape the reality that environmental conditions affect learning and the quality of instruction given by those who work in the environment.

The review of the school planning literature, including a computer ERIC search, revealed a dearth of empirical information about the relative importance of specific school building considerations. No research was found that addressed the similarities or differences of opinions of teachers, principals and architects relative to school facility design. Considering the current educational reform movement, and in anticipation of a more cooperative approach to school planning by school administrators, architects and teachers, it is important to examine the perceptions of these three groups to school building considerations. A process which will blend the expertise of design professionals and education professionals into

effective school designs may be facilitated by an objective examination of their opinions.

CHAPTER THREE

METHODOLOGY

Overview

This is a study of characteristics of school facilities and the importance they are given by three key groups involved in their design and their use. Often the design of school facilities is left in the hands of the school board, superintendent and, ultimately, the architect whom they hire.

The researcher hopes to shed light on the perceptions of representative groups of architects, teachers and principals about facilities characteristics they feel are important to reaching the goals of education yet maintaining a positive work environment. The perception of the architects, who design the facilities, will be compared to the perceptions of the teachers and principals who have to design and use educational processes within these workspaces.

The patterns of responses which emerge will be the basis for conclusions about how these different perspectives might best be used in the school facilities design process. Also of concern are the implications they have for design characteristics of the future, as they relate to the

professionalization of the teacher workplace, cost, and improvement of the instructional space.

Research Questions:

The following research questions are examined in this study:

1. How do teachers rank, by category, the importance of items related to building characteristics? Do teachers differ significantly in the way they rank those items?

2. How do principals rank, by category, the importance of items related to building characteristics? Do principals differ significantly in the way they rank those items?

3. How do architects rank by category the importance of items related to building characteristics? Do architects differ significantly in the way they rank those items?

4. How does each respondent group rank the 13 building characteristics categories in summary categories 14 and 15 in order of importance? Are there significant within group differences in the way teachers, principals, and architects rank these building categories?

5. When the rankings of teachers, principals and architects, for the same set of middle school building characteristics, are combined are there significant within group differences?

Define the population

Smith and Glass (1987) consider defining the defined population helps to narrow the study and adds credibility and generalizability to the data collected from the chosen sample. Several different types of samples may be employed, including: convenience samples chosen for proximity of the subjects; volunteer samples composed of volunteers; a quota sample which specifies a group of participants; and the "snowball" sample following a path of interested participants. These are examples of non-probability samples and are not generalizable statistically to the greater population.

Fowler (1984) indicates that a probability sampling technique will yield data of known representativeness and statistically generalizable to the greater population. These types include: a simple random sample where participants are randomly chosen; the stratified random sample, with a proportion of the population randomly chosen; and a multistage sample using secondary units out of the defined population. All of these techniques are recognized as valid survey sampling techniques. The choice of a sampling strategy rests in part on the feasibility, costs, and precision of the sample estimates.

For the principal and teacher participants, this study will use a multistage random sample of N.C. middle schools taken from the North Carolina Directory of Public Schools, 1990. The principal at each randomly chosen school will be asked to participate and he will be asked to administer the instrument to every third, eighth, and last teacher from his faculty roster. Smith and Glass (1987) indicate that this method saves the researcher time and resources, but suffers lower precision of estimates of population values.

The population defining the architects will be from the N.C. Division of Planning list of approved architectural firms for school construction. The characteristic of school building experience will be used to form a stratified pool of participants.From this pool, a random sample of architects will be chosen to participate. Fowler (1984) suggests that stratified sampling may be used as a technique when a particular group or characteristic is desired to give a more closely representative random sample of the population.

Sample size

Fowler (1984) sees the decision of sample size as related to the population chosen and the plan of analysis of the data. A further key to this,

according to Fowler, is the estimate of how many subgroups for which separate estimates are required. If not planned for, this factor could diminish the reliability of the data. One way to increase the reliability of the survey estimates is to increase the sample size.

The three participant groups will be comprised of n= 100 randomly - chosen architects, n= 100 randomly - chosen middle school principals, and n= 300 randomly - chosen middle school teachers from the defined populations. This will total 500 possible participants in the study.

Response rate

The real test of quality of the data, according to Fowler (1988) and most other research specialists, depends on the proportion of the sample group from whom data are actually collected. A low response rate or large number of poor respondents may bias the data, diminishing their generalizability to the greater population. Response rates are under control of the researcher, who must present the study effectively and make an effort to enlist cooperation. Attention to reducing the number of non- respondents should be a high priority in the survey's total design.

A minimum response rate of 60% is targeted for each group. Mail and telephone follow-ups will be used to improve the response rate. (Fowler,1984)

Instrumentation

There are many methods of data collection for the survey method, including mail, telephone, personal interview, written, and group administration. Any of these approaches which provide valid assessment of the variable specified are appropriate, according to Worthen and Saunders (1987).

The reliability of the instrument questions and the validity of the responses are of critical importance to the survey data. Smith and Glass (1987) also believe that to ensure consistent measures in comparable situations, and answers corresponding to what they are intended to measure, the researcher must take every precaution in the design and choice of questions.

It is imperative to choose proven valid designs or validate them before doing the research. Validation procedures should contain provisions for measuring content and construct validity. Smith and Glass (1987) indicate this may be accomplished by examination of the instrument by a panel of experts and by field testing the instrument. Good and Scates (1954) cited several issues relating to instrument validity. These include: instrument length; ease of administration; specificity of questions asked; lack of racial, ethnic, or gender bias; and rating scales.

Fowler sees characteristics of a good questionnaire as the following:

1. "The researcher's side of the question and answer process is fully scripted.

2. The question means the same to each respondent.

3. The kinds of answers constituting an appropriate response to the question are communicated the same to all respondents."

(Fowler, 1984 p.76)

A survey method will be used to collect data concerning a variety of variables relating to facilities characteristics. These variables have been identified from the existing literature on school construction (see attached bibliography). The survey will be composed of designed statements based on commonly - used building evaluation instruments. It will also contain statements about professional characteristics most recently mentioned in

the reform literature.

A total of 15 categories will be used in the survey instrument. Thirteen categories of characteristics relative to designing a school facility will be used. A checklist of considerations most common to each category will be listed under each category. These will be referred to as category items. In addition, the 13 categories will be assigned to one of two summary categories related to service and delivery of curriculum and general design features, respectively (see Appendix C , p. 137).

The respondents will rank each category separately, from the most important item to the least important item listed under each category: (1 for most important; 2 for next important, etc.).

Field tests:

Two field tests were conducted on the survey instrument. A preliminary field test was preformed to check for the general format and construction of the questions. The instrument was given to a group of 20 subjects similar to those who were used in the actual study. Each subject completed the instrument twice, with a one day interval between each trial. Following this first field test the instrument was revised to improve its format and remove or revise items that were problematic.

In the second field test, a different group of 30 subjects repeated the field test procedure. Subjects were given the survey twice one day apart. A total score for each item in the category was derived by summing the ranks across all responses, both for Trial 1 and Trial 2. Separate scores for Trial 1 and Trial 2 were obtained and tested for strength of correlation by the use of the Pearson Product Moment correlation formula for raw scores. A very high correlation of at least 0.99 resulted for each of the 15 categories.

Inevery instance the scores changed, but not the rankings. The instrument should provide very reliable data for the survey analysis. Summary tables reliability scores are available in Table 24 (Appendix D, 147) of this document.

Method of Data Collection

The volume of information, distances between schools and logistics of data collection strongly favor a mail survey. The surveys for teachers and principals will be sent to the principals, with instructions for administration and return (hopefully this will increase the probability of a high return). The architects will be sent the same survey and directions for return.

A further justification for a mail survey is the difficulty in measuring strength of perception using a telephone call or personal interview. The ranking will also increase the precision of the data collection through uniformity of item selection and a forced prioritization. Only those directly involved (teachers, principals, architects) would have the knowledge base to determine perception for that group.

The survey method is also less disruptive to the workday, as it may be completed at the discretion of the respondents. A last important facet is the cost of a survey method. A mail survey would be more cost efficient than travel and interviews or telephone contacts.

Data Analysis

The type of data generated and research questions will direct the analysis of the data. It may be quantified, categorized, or submitted to content analysis. Most often, according to Worthen and Saunders (1987), answers are transformed into data files for computer analysis.

The procedure which is valid may be any method which will allow the logical examination of the data. The researcher has determined the chi square method to be best suited for this study. The chi square analysis is an accepted technique for analyzing frequency data. The Kendall Coefficient of Concordance is a test of significance and strength of disagreement. This is a procedure using Chi Square to measure ordinal data such as rankings (Fergueson, 1971) The researcher has established an alpha at the .05 level.

Using the rank order data from the surveys, a descriptive measure of agreement will be calculated. The Kendall Coefficient of Concordance procedure was determined to be the best for determining a level of agreement within the subject groups on the 15 categories. The Kendall procedure produces four measures which will be used to analyze each of the 5 research questions. The alpha value indicates the statistical significance of a comparison. If a significance level of alpha below .05 is calculated the agreement or disagreement by the subjects is statistically significant. The mean scores produce an overall rank score representative of that group. The final calculation is the W-value or coefficient of concordance which indicates the strength of agreement or disagreement for the subject group on each category. To facilitate consistency of interpretation of the Kendall scores the following scale has been established.

A W-value (concordance level) equal to 0.0000 would indicate perfect disagreement or disarray within the subject group. A W-value between 0.0001 and 0.1000 represents Very High Disagreement (VHD) within the subject group for that category. A W-value between 0.1001 and 0.2000 represents High Disagreement (HD) within the subject group for that

category. W-values between 0.2001 and 0.3000 represents Fairly High Disagreement (FHD) within the subject group for that category. W-values between 0.3001 and 0.4000 represents Moderate Disagreement (MD) within the subject group for that category. A W-value between 0.4001 and 0.5000 represents Low Disagreement (LD) within the subject group for that category.

The benchmark for a shift to the agreement side has been set at a W-value between 0.5001 and 0.6000 representing Low Agreement (LA) within the subject group for that category. W-values between 0.6001 and 0.7000 represents Moderate Agreement (MA) within the subject group for that category. A W-value between 0.7001 and 0.8000 represents Fairly High Agreement (FHA) within the subject group for that category. A W-value between 0.8001 and 0.9000 represents High Agreement (HA) within the subject group for that category. A W-value between 0.9001 and 1.0000 represents Very High Agreement (VHA) within the subject group for that category. A W-value of exactly 1.000 indicates perfect agreement or concordance by the members of the subject group.

The collected data will be transposed into a data matrix. This matrix will include the categories and the response ranking for each consideration or item. These data will then be analyzed using the IBM/PC and the SPSS/PC statistical package.

The first research question is in two parts. " How do teachers rank by category the importance of items related to building characteristics? Do significant differences exist within the teacher group on the rankings?" These will be analyzed using the Kendall Coefficient of Concordance analysis. The questionnaire presents to the respondents 13 categories related to building characteristics. A Kendall analysis will produce a

significance level for the differences which may exist and a W value, which is a measure of strength of agreement or disagreement.

The second research question is also in two parts " How do principals rank, by category, the importance of items related to building characteristics? Do principals differ significantly in the way they rank those items?" These will also be analyzed using the Kendall Coefficient of Concordance analysis. The questionnaire presents to the respondents 13 categories related to building characteristics. A Kendall analysis will produce a significance level for the differences which may exist and a W value which is a measure of strength of agreement or disagreement.

The third research question is in two parts. " How do architects rank by category the importance of items related to building characteristics? Do architects differ significantly in the way they rank those items? These will again be analyzed using the Kendall Coefficient of Concordance analysis. The questionnaire presents to the respondents 13 categories related to building characteristics. A Kendall analysis will produce a significance level for the differences which may exist and a W value which is a measure of strength of agreement or disagreement.

The fourth research question addresses the 13 previous building categories. " How does each respondent group rank the 13 building characteristics categories in summary categories 14 and 15 in order of importance? Are there significant within group differences in the way teachers, principals, and architects rank these building categories?" These will be analyzed by the Kendall Coefficient of Concordance procedure. The Kendall Test will be applied to the responses for each category. This will determine if there are significant differences between the mean rankings of

the three groups on the building characteristics categories by comparing the actual mean rankings for each category to the statistical ideal. The strength of any disagreement will be determined by looking at each groups mean scores as compared to the ideal.

Rankings by definition result in discrimination. The rankings of each group will be looked at in descriptive form by looking at total mean scores and the distribution of items from most important to least important..

The fifth research question follows. "When the rankings of teachers, principals and architects, for the same set of middle school building characteristics, are combined are there significant within group differences?" This question will also be analyzed by the Kendall Coefficient of Concordance procedure. The Kendall Test will be applied to the responses for each category. This will determine if there are significant differences between the mean rankings of the three groups on the building characteristics items by comparing the actual mean rankings for each category to the statistical ideal. The strength of any difference will be determined by looking at each group's mean scores as compared to the ideal or the W-value.

Cost of the study

Several methods specialists', including Fowler (1984), Smith and Glass (1987) , and others relate the cost of a study to the design and data collection techniques chosen by the researcher. Mail and telephone procedures cost less in most cases than personal interviews, but costs usually depend on several factors. These include: questionnaire design time; questionnaire length; geographic dispersion of the sample;

availability and interest of the sample; callback procedure; respondent selection; and training of staff.

A further cost issue is the time needed to complete the study. Each mode of collection has its own optimum time frame. The methodological goals must be considered along with the design issues affecting cost and data quality when making a decision on how to collect survey data.

The mail survey will be the most cost efficient method of data collection for this study due to the extensive information requested. The telephone or personal contact methods would cost far too much for the targeted number of responses.

Ethics of the study

A final tenet of survey methodology involves the issue of ethics. Survey research needs to be sensitive to the ethical manner in which it is carried out. The basic problems, as related by most research literature, center on three principles, including the right to privacy, confidentiality, and informed consent. The basic guideline is that the researcher should make sure that no individual suffers any adverse consequences as a result of the survey. In most survey research, the risks to subjects are minimal, but attention should be given to the basic steps for ethical treatment in order to reduce any risk that may be involved according to Fowler (1984).

The list of participants in this study will be confidential and not made publicly available. The privacy of individuals will be strengthened by assigning a code number to each survey instrument sent out and code numbers to each participant. No name will be sought on the returned instrument. A key will be kept for follow-up purposes, but will be secured in a safe location by the researcher.

To inform the participants, a short explanation of the purpose of the study and use of data will be provided in the letter accompanying the survey instrument (see Appendix B, p. 131). Each respondent will be encouraged to contact the researcher if they would like a copy of the completed study results. In addition, an Institutional Review Board (IRB) form will be submitted for approval of the study .

Limitations of the study

Survey research has certain limitations that should be understood at the outset of the study. Gaulting (1967) believes that assumptions about samples should be tempered by the fact that data obtained in surveys are highly individualistic and tend to treat individuals as social units. Glock (1967) discusses the static nature of the survey method as a limiting factor. He emphasizes that the information collected exists during a specific time frame and could change if collected at another time. A field test was performed to help strengthen the reliability of the data obtained and ameliorate some of these limitations.

It is the responsibility of the researcher to report relevant details of the survey methodology that may introduce error to the data (Fowler, 1984). Most cautions about research relate to concerns as to the sample size, nature of the sample, its generalizability, methods of analysis, levels of analysis, operationalization of problems, uncontrolled variance, validity, or the amount of inference drawn from the data. Some of these cannot be seen until the study is complete. However, some are recognizable.

A major limitation of this study will be the validity and design of the survey instrument. Based on the field test performed the researchers are confident the instrument is both valid and reliable. A further limitation concerns Architects not being included in the field test for the survey

instrument. This was for two reasons. First architects, as a group, are a much smaller population group (229 on the original State Department approved list). They are not as accessible as the teacher and principal groups. Secondly, the architect responses could be more easily tainted if a large number of architects were sensitized, in advance, to the survey. To reduce the effect of this limitation key literature, written by architects about building features, was used in the question design. This would help to include features listed by both architects and planners in educational facilities. Informal discussion with an architect was also used to sound out some of the questions. This, however, will be a limitation of the study.

Other limitations are the intervening variables concerning the type of facilities each group has experience with, the leadership the respondent serves with, or the teaching method employed. Careful attention to random sampling techniques are designed to negate the effect of such intervening variables (Smith and Glass, 1987).

Another limitation exists in the data analysis. It will test for significant difference among all three groups, but will not test comparisons between pairs. Pair comparisons will be made by descriptive analysis which is less precise and less powerful.

A further data analysis limitation concerns the test for homogeneity within the groups (i.e. variance of item ranking due to design of the study). The amount of data required is overwhelming and should be undertaken only if the major thrust of the study is for homogeneity.

Limiting the study further is the choice of teachers, principals and architects for the comparison groups. There are other groups such as superintendents, board members, and parents which could provide

interesting data, but that is another study. The purpose of this study is to focus on some of the major actors in school design and users of the facility.

The final limitation concerns the inability of architects to differentiate between elementary, middle, and secondary school design features. To reduce the impact of this factor the researcher attempted to carefully design the questions to include generally accepted features for a variety of school structures.

Even with these limitations listed, the researcher believes that, it is possible to reveal if significant differences exist with-in the study groups. It is possible, also, to measure the strength of the differences which may occur.

Summary

Educational reform today has taken a turn to more autonomy and accountability for the teacher and administrators. The prospect is for more decision-making at the school and local level.

This increases the prospect for increased teacher involvement in the design process. As teacher input in the design of schools becomes increasingly important, it will be necessary for school planners and architects to become more sensitive to the perspectives of those using the spaces. With this need apparent this study will attempt to develop a body of knowledge about the perceptions of teachers , principals and architects and the goodness of fit of these perceptions to the existing characteristics of middle school buildings as determined by the literature.

CHAPTER FOUR

PRESENTATION OF RESULTS

The data consisted of importance rankings for 15 categories of school building characteristics by middle school teachers, middle school principals and architects. The first 13 categories were designed to elicit responses on a variety of school building characteristics. Questions 14 and 15 were designed as summary categories to obtain responses related to the first 13 categories.

Questionnaire responses produced rank order data. The range of the ranks for questions 1 through 13 was 1 to 5. Question 14 had a range of ranks of 1 through 7 and question 15 had a range of ranks of 1 through 6. Respondents were asked to rank the items, in the order of importance to them, from most important (number 1) to least important (highest number in the category).The mean scores of the ranks were used to produce overall rankings for the subject group.

An analysis of the importance rankings was made for each of the three subject groups to determine the relative importance of building considerations within the 15 categories. In addition comparisons were made of the importance rankings of the subject groups to determine

if significant differences existed within the subject group for the category. The analysis of the rankings served as the basis for answering the following research question.

1. How do teachers rank, by category, the importance of items related to building characteristics? Do teachers differ significantly in the way they rank those items?
2. How do principals rank, by category, the importance of items related to building characteristics? Do principals differ significantly in the way they rank those items?
3. How do architects rank by category the importance of items related to building characteristics? Do architects differ significantly in the way they rank those items?
4. How does each respondent group rank the 13 building characteristics categories in summary categories 14 and 15 in order of importance? Are there significant within group differences in the way teachers, principals, and architects rank these building categories?
5. When the rankings of teachers, principals and architects, for the same set of middle school building characteristics, are combined are there significant within group differences?

Statistical Procedure

The population for this study consisted of 100 architects, 100 middle school principals and 300 middle school teachers. These participants were randomly chosen from throughout North Carolina using the "North Carolina Education Directory 1989 - 1990". Survey methodology was used to gather data relative to the perceptions of the three subject groups about a set of new building characteristics. The usable surveys returned consisted of 55 (55%) from the architect population, 64 (64%) from the principal population, and 177 (59%) from the teacher population. The reader will see some differences in the returned survey totals for each category. This discrepancy was due to improper marking of a particular item or category, thus, making it inaccurate for use in the data.

Using the rank order data from the surveys a descriptive measure of agreement was calculated. The Kendall Coefficient of Concordance

procedure was determined to be the best for determining a level of agreement within the subject groups on the 15 categories. The Kendall procedure produces four measures which will be used to analyze each of the 5 research questions. One measure, the alpha value, indicates the statistical significance of a comparison. If a significance level of alpha below .05 is calculated the agreement or disagreement by the subjects is considered statistically significant. A second value is the mean score which produces the third value, an overall rank score, for each category representative of that group. The final calculation is the W-value or coefficient of concordance which indicates the strength of agreement or disagreement for the subject group on each category.

A W-value (concordance level) equal to 0.0000 would indicate perfect disagreement or disarray within the subject group. A W-value between 0.0001 and 0.1000 represents "Very High Disagreement" (VHD) within the subject group for that category. A W-value between 0.1001 and 0.2000 represents "High Disagreement" (HD) within the subject group for that category. W-values between 0.2001 and 0.3000 represents "Fairly High Disagreement" (FHD) within the subject group for that category. W-values between 0.3001 and 0.4000 represents "Moderate Disagreement" (MD) within the subject group for that category. A W-value between 0.4001 and 0.5000 represents "Low Disagreement" (LD) within the subject group for that category.

The benchmark for a shift to the agreement side has been set at a W-value between 0.5001 and 0.6000 representing "Low Agreement" (LA) within the subject group for that category. W-values between 0.6001 and 0.7000 represents "Moderate Agreement" (MA) within the subject group for that category. A W-value between 0.7001 and 0.8000 represents "Fairly High

Agreement" (FHA) within the subject group for that category. A W-value between 0.8001 and 0.9000 represents "High Agreement" (HA) within the subject group for that category. A W-value between 0.9001 and 1.0000 represents "Very High Agreement" (VHA) within the subject group for that category. A W-value of exactly 1.0000 indicates perfect agreement or concordance by the members of the subject group.

In order for the reader to better understand this interpretation scale, a visual representation is presented below. The left column represents the range of the Kendall Coefficient of Concordance or W-value, while the right column contains the corresponding descriptor word or phrase.

Range of W-value	Strength Descriptor
W = 0.0000	Complete Disagreement (CD)
0.0000 to 0.1000	Very High Disagreement (VHD)
0.1001 to 0.2000	High Disagreement (HD)
0.2001 to 0.3000	Fairly High Disagreement (FHD)
0.3001 to 0.4000	Moderate Disagreement (MD)
0.4001 to 0.5000	Low Disagreement (LD)
0.5001 to 0.6000	Low Agreement (LA)
0.6001 to 0.7000	Moderate Agreement (MA)
0.7001 to 0.8000	Fairly High Agreement (FHA)
0.8001 to 0.9000	High Agreement (HA)
0.9001 to 1.0000	Very High Agreement (VHA)
W = 1.0000	Complete Agreement (CA)

Data obtained from the surveys was formatted into the SPSS/PC statistical package for the IBM PC. The Kendall Coefficient of Concordance

was applied to the data to produce the measurements in the data presentation to follow. Data Presentation for Research Questions 1,2, & 3:

The first three research questions are concerned with determining the relative importance of different school building characteristics to teachers, principals and architects. These are as follows:

1. How do teachers rank, by category, the importance of items related to building characteristics? Do teachers differ significantly in the way they rank those items?
2. How do principals rank, by category, the importance of items related to building characteristics? Do principals differ significantly in the way they rank those items?
3. How do architects rank by category the importance of items related to building characteristics? Do architects differ significantly in the way they rank those items?

Building characteristics, identified as "items were assigned to thirteen groups of building considerations. These building considerations, identified as "categories", were selected from a variety of literature on school facilities planning. Each table in Appendix A, pp. 112 - 131 shows the mean score and rank for each item in the category for the three groups in the study. It also contains mean scores and ranks for the combined group on each of the items. The Kendall Coefficient of Concordance is listed for the category as the W-value in each column. The total cases represents the usable returned surveys for that category and group.

The significance level and degrees of freedom are also given to indicate if the findings are significant in relation to the established alpha level of 0.05. All categories were well below the 0.05 alpha level set by the researchers for the teacher group. The principal group categories were all below the 0.05 alpha level except for category 4 which had a alpha level of 0.0940. The alpha levels for the architect group categories were also below the 0.05 alpha level except for category 1 with a alpha level of 0.3066.

The data for the first three research questions are organized by building consideration category rather than subject group. This format was chosen to establish continuity of the data and facilitate informal comparisons of groups. References to "middle school teachers" provide data for research question 1. Reference to "middle school principals" provide data for research question 2 and a reference to "architects" provides data for research question 3.

It is not practical to provide a narrative analysis of the data for every item, category and subject group, because of the large volume of data generated by the study. A table format was used to present the data in a concise and organized manner. A narrative discussion is presented in a table by table format. The focus will be on the most important item and the least important item identified in each category by each subject group. The reader may look at the corresponding tables for a detailed presentation of the specific data.

Tables 1 through 15 (Appendix A, pp. 112 - 127) contain the mean scores and ranks (based on these mean scores) for each of the three population groups and the combined group. It is important to understand that the relationship in the tables is inverse. The lower the mean score and rank the more important the item is perceived. Conversely the higher the mean score and rank the less important the item is perceived. Tables 1 through 13 will be used in analysis of research questions 1, 2, 3 and 5. Tables 14 and 15 will be used in the analysis of research question 4 and 5.

Tables 16, 17, 18 and 19 (Appendix A, pp. 128 - 131) indicate strength of agreement or strength of disagreement of the 15 categories for each subject group. Those tables will be used with research questions 1, 2, and 3. Table 19 will be used with research question 5.

Tables 20 through 23 (Appendix B, pp. 132 - 136) are included to show a relationship of the like pairs (items ranked the same by different comparison groups) found in the survey data. These will be used to help answer research question 5.

Table 1 (Appendix A, p. 113):

The 176 middle school teachers in responding in survey Category 1 (Site Selection) ranked "Proximity" as the most important and "Topography" as the least important middle school building characteristics. Calculation of the Kendall Coefficient resulted in a 0.2853 score representing "Fairly High Disagreement" within the group. The alpha level was well below the established 0.05 level indicating there were highly significant differences in the subjects' opinions relative to category 1.

The 64 middle school principals responding in survey Category 1 (Site Selection) ranked "Proximity" as the most important and "Topography" as the least important middle school building characteristics. Calculation of the Kendall Coefficient was 0.2117 representing "Fairly High Disagreement" within the group. The alpha level was well below the established 0.05 level indicating there were highly significant differences in the subjects' opinions relative to category

The 53 architects responding in survey Category 1 (Site Selection) ranked "Proximity" as the most important and "Topography" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.0227 representing "Very High Disagreement". The alpha level was well above the established 0.05 level of significance with a

level of 0.3066. This indicates that the differences in opinion were not statistically significant for this category and group.

Table 2 (Appendix A, p. 114):

The 177 middle school teachers responding in survey Category 2 (Flexibility) ranked "Allow for increases in student population" as the most important and "Movable interior walls" as the least important middle school building characteristics. Calculation of the Kendall Coefficient was 0.3667 representing "Moderate Disagreement". The alpha level was well below the established 0.05 level of significance indicating that there were highly significant differences in the opinions of the subject group.

The 64 middle school principals responding in survey Category 2 (Flexibility) ranked "Allow for increases" in student population as the most important and "Movable interior walls" as the least important middle school building characteristics. Calculation of the Kendall Coefficient was 0.3388 representing "Moderate Disagreement". The alpha level was well below the established 0.05 level of significance indicating that there were highly significant differences in the opinions of the subject group.

The 53 architects responding in survey Category 2 (Flexibility) ranked "Allow for increases in student population" as the most important and "Movable interior walls" as the least important middle school building characteristics. The Kendall Coefficient was calculated to be 0.3062 representing "Fairly High Disagreement". The alpha level was well below the established 0.05 level indicating that their were highly significant differences in the opinions of architects.

Table 3 (Appendix A, p. 115):

The 177 middle school teachers responding in survey Category 3 (Acoustical) ranked "Sound proofing" as the most important and "Carpeting" as the least important middle school building characteristics. Calculation of the Kendall Coefficient was 0.1287 representing "High Disagreement". The alpha level was well below the established 0.05 level of significance indicating that their were highly significant differences in the opinions of teachers .

The 64 middle school principals responding in survey Category 3 (Acoustical) ranked "Circulation patterns" as the most important and "Carpeting" as the least important middle school building characteristics. The Kendall Coefficient was calculated to be 0.0975 representing "Very High Disagreement". The alpha level was well below the established 0.05 level of significance indicating that their were highly significant differences in the opinions of principals.

The 54 architects responding in survey Category 3 (Acoustical) ranked "Isolating noisy activity" as the most important and "Carpeting" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.3126 representing "Moderate Disagreement". The alpha level was well below the established 0.05 level of significance indicating that their were highly significant differences in the opinions of principals.

Table 4 (Appendix A, pp. 116):

The 176 middle school teachers responding in survey Category 4 (Regular classrooms) ranked "Storage" as the most important and "Wet areas" as the least important middle school building characteristics. The

Kendall Coefficient was calculated at 0.0709 representing "Moderate Disagreement". The alpha level was well below the established 0.05 level of significance indicating that their were highly significant differences in the opinions of teachers.

The 64 middle school principals responding in survey Category 4 (Regular classrooms) ranked "Storage" as the most important and "Wet Areas" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.0310 representing "Very High Disagreement". The alpha level was above the established alpha level of 0.05 with a 0.0940 level. This indicated that their were moderately significant differences in the opinions of principals.

The 55 architects responding in survey Category 4 (Regular classrooms) ranked "Natural lighting" as the most important and "Wet areas" as the least important middle school building characteristics. The Kendall Coefficient was calculated 0.1160 representing "High Disagreement". The alpha level was well below the established 0.05 level of significance indicating that their were highly significant differences in the opinions of the architects.

Table 5 (Appendix A, pp. 117):

The 177 middle school teachers responding in survey Category 5 (Specialized classrooms) ranked "Special design features" as the most important and "Isolation from other instructional areas" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.2453 representing "Fairly High Disagreement". The alpha level was well below the established 0.05 level of significance

indicating that there were highly significant differences in the opinions of teachers.

The 64 middle school principals responding in survey Category 5 (Specialized classrooms) ranked "Special design features" as the most important and "Isolation from other instructional areas" as the least important middle school building characteristics. Calculation of the Kendall Coefficient was 0.2924 representing "Fairly High Disagreement". The alpha level was well below the established 0.05 level of significance indicating that there were highly significant differences in the opinions of principals.

The 55 architects responding in survey Category 5 (Specialized classrooms) ranked "Special design features" as the most important and "Isolation from other instructional areas" as the least important middle school building characteristics. The Kendall Coefficient was 0.4376 representing "Low Disagreement". The alpha level was well below the established 0.05 level of significance indicating highly significant differences in the opinions of architects.

Table 6 (Appendix A, pp. 118):

The 177 middle school teachers responding in survey Category 6 (Administrative areas) ranked "Size of office complex" as the most important and "Reception area" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.0589 representing "Very High Disagreement". The alpha level was well below the established 0.05 level of significance indicating that there were highly significant differences in the opinions of teachers.

The 64 middle school principals responding in survey Category 6 (Administrative areas) ranked "Size of office complex" as the most important and "record storage" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.1573 representing "High Disagreement". The alpha level was well below the established 0.05 level of significance indicating that there were highly significant differences in the opinions of principals.

The 53 architects responding in survey Category 6 (Administrative areas) ranked "Size of office complex" as the most important and "Conference rooms" as the least important middle school building characteristics. The Kendall Coefficient was calculated to be 0.1778 representing "High Disagreement". The alpha level was well below the established 0.05 level of significance indicating that there were highly significant differences in the opinions of architects.

Table 7 (Appendix A, pp. 119):

The 176 middle school teachers responding in survey Category 7 (Media center) ranked "Central location" as the most important and "Equipment storage" as the least important middle school building characteristics. The Kendall Coefficient was calculated to be 0.2309 representing "Fairly High Disagreement". The alpha level was well below the established 0.05 level of significance indicating that there were highly significant differences in the opinions of teachers.

The 64 middle school principals responding in survey Category 7 (Media center) ranked "Central location" as the most important and a "Screening room" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.3883

representing "Moderate Disagreement". The alpha level was well below the established 0.05 level of significance indicating that there were highly significant differences in the opinions of principals.

The 54 architects responding in survey Category 7 (Media center) ranked "Central location" as the most important and a "Screening room" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.5750 representing "Low Agreement". The alpha level is well below the established 0.05 level of significance indicating that there were highly significant differences in the opinions of architects.

Table 8 (Appendix A, pp. 120):

The 176 middle school teachers responding in survey Category 8 (Aesthetics) ranked "Building design in harmony with the environment" as the most important and "Uniqueness" of design as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.2146 representing "Fairly High Disagreement". The alpha level was well below the established 0.05 level of significance indicating that there were highly significant differences in the opinions of teachers.

The 64 middle school principals responding in survey Category 8 (Aesthetics) ranked "Building design in harmony with the environment" as the most important and a "Uniqueness" of design as the least important middle school building characteristics. The Kendall Coefficient was calculated to be 0.3275 representing "Moderate Disagreement". The alpha level was well below the established 0.05 level of significance indicating that there were highly significant differences in the opinions of principals.

The 53 architects responding in survey Category 8 (Aesthetics) ranked "Building design in harmony with the environment" as the most

important and "Furniture which blends with the design" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.5977 representing "Low Agreement". The alpha level was well below the established 0.05 level of significance indicating that there were highly significant differences in the opinions of architects.

Table 9 (Appendix A, pp. 121):

The 175 middle school teachers responding in survey Category 9 (Professional features) ranked "Office equipment" as the most important and "Professional library" as the least important middle school building characteristics. The Kendall Coefficient was calculated 0.1969 representing "High Disagreement". The alpha level was well below the established 0.05 level significance indicating that there were highly significant differences in the opinions of teachers.

The 64 middle school principals responding in survey Category 9 (Professional features) ranked "Teacher workroom" as the most important and "Telephone in the classroom or teacher office" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.1945 representing "High Disagreement". The alpha level was well below the established 0.05 level of significance indicating that there were highly significant differences in the opinions of the principals.

The 53 architects responding in survey Category 9 (Professional features) ranked "Teacher workroom" as the most important and "Telephone in the classroom or teacher office" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.2543 representing "Fairly High Disagreement". The alpha

level was well below the established 0.05 level of significance indicating that there were highly significant differences in the opinions of architects.

Table 10 (Appendix A, pp. 122):

The 175 middle school teachers responding in survey Category 10 (Student Service) ranked "Location" as the most important and "Suitability for community use" as the least important middle school building characteristics. The Kendall Coefficient was calculated to be 0.3385 representing "Moderate Disagreement". The alpha level was well below the established 0.05 level significance indicating that there were highly significant differences in the opinions of teachers.

The 64 middle school principals responding in survey Category 10 (Student service) ranked "Location" as the most important and "Suitability for community use" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.3221 representing "Moderate Disagreement". The alpha level was well below the established 0.05 level of significance indicating that there were highly significant differences in the opinions of principals.

The 54 architects responding in survey Category 10 (Student service areas) ranked "Location" as the most important and "Suitability for community use" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.2400 representing "Moderate Disagreement". The alpha level was well below the established 0.05 level of significance indicating that there were highly significant differences in the opinions of architects.

Table 11 (Appendix A, pp. 123):

The 176 middle school teachers responding in survey Category 11 (Environmental control) ranked "Temperature control in each room" as the most important and "Ease of maintenance" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.1286 representing "High Disagreement". The alpha level was well below the established 0.05 level of significance indicating that there were highly significant differences in the opinions of teachers.

The 64 middle school principals responding in survey Category 11 (Environmental control) ranked "Energy efficiency" as the most important and "Noise level" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.1107 representing "High Disagreement". The alpha level was well below the established 0.05 level of significance indicating that there were highly significant differences in the opinions of principals.

The 54 architects responding in survey Category 11 (Environmental control) ranked "Dependability" as the most important and "Noise level" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.1953 representing "High Disagreement". The alpha level is well below the established 0.05 level of significance indicating that there were highly significant differences in the opinions of architects.

Table 12 (Appendix A, pp. 124):

The 175 middle school teachers responding in survey Category 12 (Gymnasium) ranked "Size of facility" as the most important and "Suitability for community use" as the least important middle school

building characteristics. The Kendall Coefficient was calculated at 0.2760 representing "Fairly High Disagreement". The alpha level was well below the established 0.05 level of significance indicating that there were highly significant differences in the opinions of teachers.

The 64 middle school principals responding in survey Category 12 (Gymnasium) ranked "Size of facility" as the most important and "Suitability for community use" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.2682 representing "Fairly High Disagreement". The alpha level was well below the established 0.05 significance level indicating that there were highly significant differences in the opinions of principals.

The 54 architects responding in survey Category 12 (Gymnasium) ranked "Location" as the most important and "Inclusion of instructional areas" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.1425 representing "High Disagreement". The alpha level was well below the established 0.05 significance level indicating that there were highly significant differences in the opinions of architects.

Table 13 (Appendix A, pp. 125):

The 175 middle school teachers responding in survey Category 13 (Cost) ranked "Size of facility" as the most important and "Special feature cost" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.0900 representing "Very High Disagreement". The alpha level was well below the established 0.05 significance level indicating that there were highly significant differences in the opinions of teachers.

The 64 middle school principals responding in survey Category 13 (Cost) ranked "Size of facility" as the most important and "Special feature cost" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.0883 representing "Very High Disagreement". The alpha level was well below the established 0.05 significance level indicating that there were highly significant differences in the opinions of principals.

The 54 architects responding in survey Category 13 (cost) ranked "Size of the facility" as the most important and "design and planning cost" as the least important cost related middle school building characteristics. The Kendall Coefficient was calculated at 0.3748 representing "Moderate Disagreement". The alpha level was well below the established 0.05 significance level indicating that there were highly significant differences in the opinions of architects.

Summary of Data Analysis for Research Question 1

Research question 1 examines how middle school teachers ranked in importance items within the 13 categories of building features. It also inquires if teachers differ significantly in their rankings. Answering this two part question requires that we determine the importance ranking for each item. In addition we must determine the strength and significance level of any differences which might exist.

The mean scores and ranks provide the appropriate information to determine the items of importance for teachers in the 13 categories. These rankings may be found in tables 1 through 13 in Appendix A. Teachers

ranked the following items as most important in each category. Column one has the category number, column two the category description and column three the item ranked as most important by the teachers for that category.

Category	Description	Items
Category 1	Site selection	Proximity to students
Category 2	Flexibility	Allows for growth
Category 3	Acoustical	Sound proofing
Category 4	Regular Class.	Storage and shelving
Category 5	Specialized instructional areas	Specialized design
Category 6	Administrative areas	Size of office
Category 7	Media center	Central location
Category 8	Aesthetics / Appearance	Building in harmony with the environment
Category 9	Professional features	Access to office equipment
Category 10	Student service areas	Location
Category 11	Environmental control in each room	Temperature control
Category 12	Gymnasium	Size of space
Category 13	Cost of school facility	Size of facility

The Kendall Coefficient of Concordance procedure produces measurements of significance and strength of agreement or disagreement within the group on each category. Application of this procedure to the middle school teachers responses revealed that there were highly significant levels of disagreement within all 13 building categories.

Table 16 (Appendix A, p. 128) shows the concordance levels for the 13 building categories and the summary categories 14 and 15. These are presented in order of strength of disagreement from the least disagreement to the most disagreement. Teachers disagreed strongest in category 6, "administrative areas" with a W-value of 0.0589 representing "Very High Disagreement" . Teachers disagreed least in category 2 "flexibility", with a W-value of 0.3667 representing "Moderate Disagreement".

Summary of Data Analysis for Research Question 2:

Research question 2 examines the importance ratings of the middle school principals surveyed on the items within the 13 categories of building categories. It is also asked if principals differ significantly in their rankings. Answering this two part question requires that we determine the importance ranking for each item. In addition we must determine the strength and significance level of any differences which might exist.

The mean scores and ranks provide the appropriate information to determine the items of importance for teachers in the 13 categories. These rankings may be found in the corresponding tables 1 through 13 in Appendix A. Principals ranked the following items as most important in each category:

Category Description		Items
Category 1	Site selection	Proximity to students
Category 2	Flexibility	Allows for growth
Category 3	Acoustical	Circulation patterns
Category 4	Regular Class.	Storage and shelving
Category 5	Specialized instructional areas	Specialized design
Category 6	Administrative	Size of office
Category 7	Media center	Central location
Category 8	Aesthetics / Appearance	Building in harmony with the environment
Category 9	Professional	Teacher workroom
Category 10	Student service areas	Location
Category 11	Environmental control	Energy efficiency
Category 12	Gymnasium	Size of space
Category 13	Cost of school facility	Size of facility

The Kendall Coefficient of Concordance procedure produces measurements of significance and strength of agreement or disagreement within the group on each category. Application of this procedure to the middle school principals responses revealed that there were highly significant levels of disagreement within all 13 building categories except category 3. With a significance level of 0.0940 category 3 showed significance slightly above the established alpha of 0.0500. This indicates

differences in principal opinions on category 3 exist, but at a less significant level than found in all other categories.

Table 17 (Appendix A, p. 1289 shows the concordance levels for the 13 building categories and the summary categories 14 and 15. These are presented in order of strength of disagreement from the least disagreement to the most disagreement. Principals disagreed strongest in category 4, "regular classrooms" with a W-value of 0.0310 representing "Very High Disagreement" . Principals disagreed least in category 7, "media center", with a W-value of 0.3883 representing "Moderate Disagreement".

Summary of Data Analysis for Research Question 3:

Research question 3 examines the importance ratings of the architects surveyed on the items within the 13 categories of building categories. It is also asked if architects differ significantly in their rankings. Answering this two part question requires that we determine the importance ranking for each item. In addition, we must determine the strength and significance level of any differences which might exist.

The mean scores and ranks provide the appropriate information to determine the items of importance for architects in the 13 categories. These rankings may be found in the corresponding tables 1 through 13 in Appendix A. Architects ranked the following items as most important in each category:

Category Description		Items
Category 1	Site selection	Proximity to students
Category 2	Flexibility	Allows for growth
Category 3	Acoustical	Isolation of noise

Category 4	Regular Class.	Natural lighting
Category 5	Specialized instructional areas	Specialized design
Category 6	Administrative	Size of office
Category 7	Media center	Central location
Category 8	Aesthetics / Appearance	Building in harmony with the environment
Category 9	Professional	Teacher workroom
Category 10	Student service areas	Location
Category 11	Environmental control	Dependability
Category 12	Gymnasium	Location
Category 13	Cost of school facility	Size of facility

The Kendall Coefficient of Concordance procedure produces measurements of significance and strength of agreement or disagreement within the group on each category. Application of this procedure to the architects' responses revealed that there were highly significant levels of disagreement within all 13 building categories except category 1. With a significance level of 0.3068, category 3 showed significance well above the established alpha of 0.0500. This indicates differences in principal opinions on category 3 exist, but not at a statistically significant level. The Kendall procedure does not give enough information to determine the cause of this aberrant result. The researcher speculates that the cause is the close

proximity of the observed mean scores and the expected mean scores indicating random, rather than significant, disagreement.

Table 18 (Appendix A, p. 130) shows the concordance levels for the 13 building categories and the summary categories 14 and 15. These are presented in order of strength of disagreement from the least disagreement to the most disagreement. Architects disagreed strongest in category 1, "site selection" with a W-value of 0.0227 representing "Very High Disagreement". Principals disagreed least in category 8, "aesthetics / appearance", with a W-value of 0.3883 representing "Moderate Disagreement".

Data Presentation for Research Question 4:

Research question 4, " How does each respondent group rank the 13 building characteristics categories in summary categories 14 and 15 in order of importance? Are there significant within group differences in the way teachers, principals, and architects rank these building categories?", will be analyzed in the following discussion.

Tables 14 and 15 (Appendix A, pp. 126 - 127) show the mean scores and ranks for each item in Category 14 (Service and curriculum) and Category 15 (General design) for the three groups in the study. The mean scores for the middle school teachers rankings are in column one. Column two ranks the items based on these mean scores. Column three contains the data for the middle school principals means with column four the corresponding ranks. The architects mean scores are in column five and the corresponding ranks in column six. The Kendall Coefficient of Concordance is listed for the category as the W-value in each column. The total cases represents the usable returned surveys for that category and

group. Finally, the alpha level and degrees of freedom are also located at the bottom of each corresponding group column.

The data for Category 14 (Service and curriculum) are presented in table 14 Appendix A, p. 126. The most important category and least important category will be discussed along with the Kendall Coefficient of Concordance and significance level. All categories and their ranking may be found in the corresponding tables in Appendix A.

The 175 middle school teachers responding in survey Category 14 (Service and curriculum) ranked "Regular classrooms" as the most important and "Administrative areas" as the least important middle school building categories. The Kendall Coefficient was calculated at 0.3024 representing "Moderate Disagreement" within the group. The alpha level was well below the established 0.05 significance level, indicating highly significant differences in the opinions of the teachers.

The 64 middle school principals responding in survey Category 14 (Service and curriculum) ranked "Regular classrooms" as the most important and "Administrative areas" as the least important middle school building categories. The Kendall Coefficient was calculated at 0.3299 representing "Moderate Disagreement" within the group. The alpha level was well below the established 0.05 significance level, indicating highly significant differences in the opinions of the principals.

The 54 architects responding in survey Category 14 (Service and curriculum) ranked "Media center" as the most important and "Administrative areas" as the least important cost related middle school building categories. The Kendall Coefficient was calculated at 0.1306 representing "High Disagreement" within the group. The alpha level is well below the established 0.05 significance level, indicating highly

significant differences in the opinions of architects. The data for Category 15 (General design) are presented in table 15 Appendix A, p. 126. The most important category and least important category will be discussed, along with the Kendall Coefficient of Concordance and significance level. All categories and their ranking may be found in the corresponding tables in Appendix A pp. 113-127.

The 175 middle school teachers responding in survey Category 15 (General design) ranked "Flexibility of design" as the most important and "Aesthetics" as the least important middle school building categories. The Kendall Coefficient was calculated at 0.1142 representing "High Disagreement" within the group. The alpha level was well below the established 0.05 significance level, indicating highly significant differences in the opinions of the teachers.

The 64 middle school principals responding in survey Category 15 (General design) ranked "Cost" as the most important and "Aesthetics" as the least important middle school building categories. The Kendall Coefficient was calculated at 0.1443 representing "High Disagreement" within the group. The alpha level was well below the established 0.05 significance level, indicating highly significant differences in the opinions of the principals.

The 54 architects responding in survey Category 15 (General design) ranked "Flexibility" of design as the most important and "Acoustical treatment" as the least important cost related middle school building categories. The Kendall Coefficient was calculated at 0.2621 representing "Fairly High Disagreement" within the group. The alpha level was well below the established 0.05 significance level, indicating highly significant differences in the opinions of the architects.

Data Analysis for Research Question 4:

Research question 4 examines how each of the subject groups ranks in order of importance the 13 building consideration categories and if differences which may occur are significant. The 13 categories are presented in survey questions 14 and 15. The categories are presented in two questions to promote more accurate responses by the subjects and to make the data more manageable. Two distinct groups of categories were determined. Seven of the categories were considerations relative to service and curriculum delivery to students. They were listed in survey question 14. The remaining six categories were general design features of a structure and were listed in survey question 15.

An examination of Table 14 reveals that teachers rank "Regular classrooms" as the most important category and "Administrative areas" as the least important category. The Kendall value calculated for question 14 was 0.3024, representing a "Moderate Disagreement" within the teacher subject group. Teacher rankings of the summary items indicate that three of the top four category rankings are concerned with the delivery of instruction to the student. Thus, teachers seem to be most concerned with classroom instruction features of the school facility.

The principals' rankings of Category 14 items indicate "Regular classrooms" as the most important category and "Administrative areas" as the least important category. The Kendall value calculated for question 14 was 0.3299 representing a "Moderate Disagreement" within the principal subject group. Principal rankings of the summary items indicate that

the top three category rankings are concerned with the delivery of instruction to the student. Thus, principals, as do teachers, seem to be most concerned with classroom instruction features of the school facility.

Architect rankings of Category 14 items indicate the "Media center" as the most important category and "Administrative areas" as the least important category. The Kendall value calculated for question 14 was 0.1306 representing a "High Disagreement" within the architect subject group. The architects also indicate that the three top ranked categories were those concerned with the delivery of instruction to the student. The emphasis was slightly different from the teacher and principal groups with the "Media center" being most important. It is also interesting that the strength of disagreement was strongest in the architect subject group.

The data for Category 15 is presented in Table 15. Teachers ranked "Flexibility" as the most important category and "Aesthetics / Appearance" as the least important category. The Kendall value calculated for question 15 was 0.1142 representing "High Disagreement" within the teacher subject group for question 15. An examination of the teacher rankings reveals that teachers again ranked items which affect the instructional process in some direct way highest.

Principals ranked "Total cost of facility" as the most important category and "Aesthetics / Appearance" as the least important category. The Kendall value calculated for question 15 was 0.1443 representing "High Disagreement" within the principal subject group for question 15. An examination of the principal rankings reveals that principals again ranked items which affect the instructional process in some direct way highest, with the exception of cost of the facility. The relatively high rank of cost and

low rank of acoustical treatment illustrates that, while the principals perspectives tended to be similar to teachers, there were some differences in their rankings.

An examination of the data for architects in table 15 shows more consistency of rankings than the other subject groups. Architects rank as most important "Flexibility" and least important "Acoustical treatment". The Kendall value calculated for question 15 was 0.2621 representing "Fairly High Disagreement"within the architect subject group for question 15. Architects appear to rank items related to the practical use of the facility such as "Cost", "Environmental control" and "Aesthetics / Appearance" more highly than other subject groups. The architect group showed greater similarity to the principal group in rankings than the teacher group for Category 15 items.

Data Presentation for Research Question 5:

Research question 5 stated, "When the rankings of teachers, principals and architects, for the same set of middle school building characteristics, are combined are there significant within-group differences?"

Tables I through 15 (Appendix A p. 113 - 127) show the mean scores for the combined rankings (teachers, principals, and architects) in column seven. Column eight ranks the items based on these mean scores. The Kendall Coefficient of Concordance or W-value, significance level, degrees of freedom and total usable surveys are given at the end of column 7. In all categories a level of significance below the established .05 level was indicated.

The combined 293 respondents in survey category 1

(site selection) ranked "proximity" as the most important and "topography" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.1982 representing "High Disagreement". The alpha level was well below the established 0.05 significance level, indicating highly significant differences in the opinions of the combined groups.

The combined 294 respondents in survey category 2 (flexibility) ranked "allow for increases in student population" as the most important and "movable interior walls" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.3374, representing "Moderate Disagreement". The alpha level was well below the established 0.05 significance level, indicating highly significant differences in the opinions of the combined subject groups.

The combined 295 respondents in survey category 3 (acoustical) ranked "sound proofing" as the most important and "carpeting" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.1115, representing "High Disagreement". The significance level was well below the established 0.05 significance level, indicating highly significant differences in the opinions of the combined subject groups.

The combined 295 respondents in survey category 4 (regular classrooms) ranked "storage" as the most important and "wet areas" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.0391, representing "Very High Disagreement". The alpha level was well below the established 0.05 significance level, indicating highly significant differences in the opinions of the combined subject groups.

The combined 295 respondents in survey category 5 (specialized classrooms) ranked "special design features" as the most important and "isolation from other instructional areas" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.2808, representing Fairly High Disagreement". The alpha level was well below the established 0.05 significance level, indicating highly significant differences in the opinions of the combined subject groups.

The combined 294 respondents in survey category 6 (administrative areas) ranked "size of office complex" as the most important and "record storage" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.0818, representing "Very High Disagreement". The alpha level was well below the established 0.05 significance level, indicating highly significant differences in the opinions of the combined subject group.

The combined 294 respondents in survey category 7 (media center) ranked "central location" as the most important and a "screening room" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.3029, representing "Moderate Disagreement". The alpha level, was well below the established 0.05 significance level indicating highly significant differences in the opinions of the combined subject groups.

The combined 293 respondents in survey category 8 (aesthetics) ranked "building design in harmony with the environment" as the most important and a "uniqueness of design" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.2811, representing "Fairly High Disagreement". The alpha level was well

below the established 0.05 significance level, indicating highly significant differences in the opinions of the combined subject groups.

The combined 293 respondents in survey category 9 (professional features) ranked "office equipment" as the most important and "telephone in the classroom or teacher office" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.1662, representing "High Disagreement". The alpha level was well below the established 0.05 level significance level, indicating highly significant differences in the opinions of the combined subject groups.

The combined 293 respondents in survey category 10 (student service) ranked "location" as the most important and "suitability for community" use as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.3084, representing "Moderate Disagreement". The alpha level was well below the established 0.05 significance level, indicating highly significant differences in the opinions of the combined subject groups.

The combined 294 respondents in survey category 11 (environmental control) ranked "dependability" as the most important and "noise level" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.0930, representing very "High Disagreement". The alpha level was well below the established 0.05 significance level, indicating highly significant differences in the opinions of the combined subject groups.

The combined 293 respondents in survey category 12 (gymnasium) ranked "size of space" as the most important and "suitability for community use" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.2303,

representing "Fairly High Disagreement". The alpha level is well below the established 0.05 significance level, indicating highly significant differences in the opinions of the combined subject groups.

The combined 293 respondents in survey category 13 (cost) ranked "size of facility" as the most important and "special feature cost" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.1126, representing "High Disagreement". The alpha level was well below the established 0.05 significance level, indicating highly significant differences in the opinions of the combined subject groups.

The combined 286 respondents in survey category 14 (service and curriculum) ranked "regular classrooms" as the most important and "administrative areas" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.2564, representing "Fairly High Disagreement". The alpha level was well below the established 0.05 significance level, indicating highly significant differences in the opinions of the combined subject groups.

The combined 292 respondents in survey category 15 (general design) ranked "flexibility of design" as the most important and "aesthetics" as the least important middle school building characteristics. The Kendall Coefficient was calculated at 0.1242, representing "High Disagreement". The alpha level was well below the established 0.05 significance level, indicating highly significant differences in the opinions of the combined subject groups.

Data Analysis for Research Question 5:

Research question 5 examines the three subject groups (teachers, principals, and architects) combined into one total group of 295 individual respondents. The goal was to determine if significant differences exist within this combined group and the strength of these differences.

The Kendall Coefficient of Concordance (W-value) statistical procedure will again be employed to determine the strength of disagreement. The Alpha value will be used to test for significant differences within the subject groups. Those values were calculated for a data set consisting of the combined responses for the three subject groups.

Examination of the data for question 5 revealed that in all 15 categories the significance level was well below the established 0.05 alpha level. This indicates that in all 15 categories highly significant differences in the opinions of the combined group exist for the categories.

Table 19 (Appendix A, p. 131) shows the categories for the combined population groups from the highest strength of agreement to the lowest strength of agreement. This representation is helpful for showing the various categories as related to each other for the subject group. It does not follow that this strength of agreement or disagreement indicates any importance rating for the items within the categories. The strongest disagreement for the combined group exist for category 4, "regular classrooms", with a W value of 0.0391, indicating very high disagreement. The least disagreement for the combined group exist for category 2, "Flexibility", with a W value of 0.3374, indicating only "Moderate Disagreement".

Tables 20, 21, 22, and 23 (Appendix B, pp. 133 - 136) also indicate the number of items on which the comparison groups agree or disagree in each

category. This is stated as a percent of agreement in the third column. A detailed analysis of items of agreement and disagreement indicates the following.

The teacher / principal comparison in table 20 (Appendix B, p. 133) showed 100% agreement of mean ranks in 4 categories (categories 1,4,5,and 8). An agreement level of 80% was found in category 12. Category 14 showed an agreement level of 71%. Categories 2 and 13 showed 60% agreement and 33% to 40% agreement was found in 4 other categories (categories 3,6,7,and 15). Categories 9 and 11 provided 20% agreement. Of the 15 total categories, comprising 78 items, the teachers' and principals' mean ranks agreed on 50 of the 78 for a overall 64% agreement. Thus, substantial disagreement exists between the teachers and principals even though among the groups they showed the highest level of agreement on mean ranks.

The principal / architect comparison in table 21 (Appendix B, p. 134) shows 100% agreement of mean ranks on items in 2 categories (categories 5 and 10). Principals and architects showed 60% agreement in 6 categories (categories 2,6,7,8,9 and 11) with 29% and 40% on categories 14 and 15 respectively. Agreement of 20% or less was found on categories 3, 4 and 15 with no agreement on any items in category 12. Of the 15 total categories, comprising 78 items, the principals' and architects' mean ranks agreed on 38 of the 78 for an overall 49% agreement. Thus, substantial disagreement exists between the principals and architects although they showed the second highest level of agreement on mean ranks.

The architect / teacher comparison in table 22 (Appendix B, p. 135) showed 100% agreement of mean ranks in 2 categories (categories 5 and 10). Agreement of 60% was found in 5 categories (categories 1,2,6,7,and 8)

and agreement of less than 29% in 5 categories (categories 3,4,13,14, and 15). No agreement on any items is indicated for categories 9,11 and 12. Of the 15 total categories, comprising 78 items, the architects' and teachers' mean ranks agreed on 31 of the 78 for a overall 40% agreement. Thus, substantial disagreement exists between the teachers and architects even though they showed the third highest level of agreement on the mean ranks.

The principal / teacher / architect comparison in table 23 (Appendix B, p. 136) shows 100% agreement of the mean ranks in 2 categories (categories 5 and 10). Agreement of 60 % was found in 2 categories (categories 1 and 8). Agreement of 40% was indicated in 3 categories (categories 2,6 and 7) with 4 categories (categories 3, 4, 13 and 14) showing less than 29% agreement. No agreement on any items is indicated for categories 9, 11, 12, and 15. Of the 15 total categories, comprising 78 items, the principals', teachers', and architects' mean ranks agreed on 27 of the 78 items for a overall 35% agreement. Thus, substantial disagreement exists between the three groups with the lowest level of agreement on mean ranks apparent in this comparison.

Considering the Kendall Coefficient of Concordance and the matched pair comparisons, discussed previously, the highest level of disagreement existed between the teacher group and the architects on importance ratings for the same set of building characteristics. The least disagreement existed between the teacher group and the principal group on importance ratings for the same set of building characteristics and even though disagreement existed between the principals and architects the strength of disagreement (W value) and percent of agreement values fall between the teacher / principal and teacher / architect values.

Summary:

An examination of the perceived importance ranks for a set of middle school building characteristics by teachers, principals, and architects was made in this study. The data from the respondents in the subject groups were presented in this chapter. The Kendall Coefficient of Concordance statistical procedure was preformed on the "mean" importance rankings generated. This procedure will determine strength of disagreement and statistical significance of the differences.

An analysis was made of the relative importance, to each subject group, of items within 13 categories of building considerations. In addition, the overall importance of the thirteen building considerations was examined. Statistical comparisons were made of different combinations of groups to allow analysis of the amount of agreement and disagreement that occurred in the responses of teachers, principals, and architects within and between groups.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

An examination of the perceptions of middle school teachers, middle school principals, and architects relative to a set of middle school building characteristics for a new school facility was made in this study. These groups were chosen because of their involvement in either the use or design of school facilities. The data gathered in this study illustrate the perspectives of middle school teachers, middle school principals, and architects relative to school design. Today school reform has the potential to elevate the status of educators in the decision making process. Therefore, it is important to recognize and attend to the opinions of educators when new educational facilities are planned.

An examination of the literature uncovered no studies regarding the perceptions of teachers, principals and architects with respect to building considerations. Thus, an important contribution of this study may be the knowledge base drawn from the data produced by these three groups. Comparison and examination of that knowledge base may identify some preferences that can be applied to the building specifications process.

Another important aspect of this study concerns understanding the needs for future building design characteristics and processes. The primary method of such future planning has historically been the planning survey. In North Carolina, this planning process equates to the Educational Specifications Process, a detailed process by which facilities are planned and built in North Carolina. The tendency has been for the local board to hire an architectural firm to write the educational specifications. Those most intimately involved in the use of the facility are rarely included in this process. Therefore, a body of knowledge in this area might be needed to better understand the needs for future building design characteristics and processes.

A study of the literature also revealed that physical plants of the future will be expected to absorb new pressures created by reforms. The history of facilities which house educational programs has been peppered with some creative ideas, but for the most part the traditional school building and its antecedent characteristics have prevailed for almost 150 years. New curricula, changes in society, technological changes, new instructional techniques, competition in a world market and other pressures have created new demands on educational programs and those who implement them. Thus, determining important building characteristics for future designs and developing processes for planning such designs will be very important to efficient use of scarce tax dollars and delivery of quality instruction.

In regard to the methodology used in this study, a survey instrument was designed and validated by the researchers. The survey was then administered to the three subject groups. This instrument asked subjects to give importance rankings for building characteristics commonly accepted

as necessary by experts in school planning. A contribution of this study was the development of the survey instrument which was based on the school planning literature.

A random sample of the subject groups was surveyed across North Carolina on 15 categories of educational building characteristics. These 15 categories were developed from the literature on school facilities design and construction. A sample size large enough to insure strength and reliability of results was chosen. The responses for the subject groups were n=177 for teachers, n=64 for principals and n=55 for architects.

The Kendall Coefficient of Concordance was determined to be the most appropriate statistical method for data analysis. The strength of agreement or disagreement may be determined from the W-value calculated using this statistical method. It also provides a significance level or alpha calculation. This enabled the researchers to determine significant differences within each subject group (teachers, principals, and architects) and within the groups combined. It further allowed for the measure of the strength of such differences. Chapter IV presents the results of the statistical analysis performed on the respondent rankings.

The five research questions were answered by examining how each subject group responded to 15 categories of building characteristics. The subsequent data analysis provided insight into each subject group's opinions about the same set of school design features. Conclusions and recommendations were formulated from the data analysis of Chapter IV. These will be presented in the discussions to follow.

Conclusions

The conclusions developed in this study were the result of inductive reasoning. Data gathered from the surveys returned by the subject groups, provided an extensive amount of information which was analyzed in Chapter IV. The conclusions discussed in this section are based on that analysis and the review of literature from Chapter II. Such conclusions are interpretations and meant to be speculative in nature, but with factual support coming from the data analysis and previous research.

The large amount of information generated by the analysis and literature review must be focused on the research questions. It would be very easy to lose the important issues addressed by these research questions by excursions into the subtle nuances of the data. The concluding statements will be organized in the same order as the research questions to avoid such tangential thinking. The reader should also remember that the data in this study were from the "middle school" teacher and principal perspective. Conclusions based on these data alone will reflect a middle school perspective. A companion study for elementary schools was performed in conjunction with this middle school study. Thus, some of the conclusions discussed may be generalized to a broader segment of the educational population.

Chapman (1991) has conducted a companion study of elementary school teachers and principals in concert with this study. Chapman (1991), using identical methodology, reached similar conclusions based on the responses of elementary teachers and elementary principals. The same architect data were used for both studies. The similarity of findings from these studies was supportive of some limited generalizations about teachers, principals and architects.

Research Question 1

Research question 1 examined the perceptions of middle school teachers relative to a set of building characteristics. It also examined if significant differences exist within this subject group in the way that they rank items in 13 categories.

The subject group with the most disagreement within its population was the teacher group, with only 5 of the 15 categories showing disagreement levels or Kendall Coefficient of Concordance values in the Moderate to Low range of interpretation. It is of interest that the categories showing least within- group disagreement among teachers concerned instructional delivery.

Instructional delivery is the responsibility of teachers, making them one of the closest users of the facility. They interact with the physical aspects of the facility on a regular basis, designing and implementing the educational activities performed within the structure. Teachers view instructional characteristics as the most important for a school facility. Regular classrooms, specialized classrooms, and student services are some of the most important categories for teachers. Sound proofing, storage, size of spaces, access to office equipment, room temperature control etc. are some of the items cited as high in importance to teachers. These concerns are instruction delivery related.

Perhaps the most basic instructional delivery feature of a facility is the "regular classrooms". It may not be unusual for teachers to view the classroom as their space. It is also not surprising that teachers showed Very High Disagreement in the characteristics for this category. The teacher views the classroom as a personal workspace. Building features that can facilitate and enhance the educators' role are of high importance

to the teacher. Responses by teachers may reflect more than the desire to be more efficient at educating students. Teacher satisfaction with the environment may be of concern to teachers, in addition to student learning.

Specific items of concern in a facility may be related to the experiences of the various teachers involved in its use. Instruction by a teacher in an excellent facility with few needs may shape a different perception of what a new facility needs than those experiences of a teacher in poor or inadequate facilities. The strong orientation of teachers toward instructional features could suggest that the teacher rankings are a reflection of poor instructional settings in some existing schools. Those facilities that were designed with little teacher input, may contain building features that inhibit effective instruction. It would be expected that teachers would recognize such weaknesses, desire to change them, and rank them high in importance.

Support for the idea that some existing educational facilities may be lacking may be revealed by one conclusion from the study which seems surprising when first viewed. Teachers did not rate professional characteristics as high as one might expect. This may be the result of teachers' perception of their workspace and lack of professional status. In an era of blame and attack on education, in particular teachers, it is hard for teachers to feel very positive about professionalism. Furthermore, teachers have little experience being treated in a professional manner. Difficult working conditions due to poor design of the instructional work space would create higher sensitivity to certain facility features. Teachers who have encountered poor working conditions would be more likely to rank professional features lower. This creates an atmosphere where teachers may not perceive what professional standards and behavior are

expected of them. Professional characteristics of the facility are new areas to which teachers must be introduced.

Research Question 2

Research question 2 examined the perceptions of middle school principals relative to a set of building characteristics. It also examined if significant differences exist within this subject group.

The principals' strength of disagreement fell somewhere between the teachers and architects. Principals elicited disagreement levels in the Moderate to Low range on 7 of the 15 categories. This may be the result of principals being trained in more diverse areas than teachers. Yet, principals have been teachers and, therefore, have more commonalities with teachers than with architects.

The principal's view of middle school building characteristics originates from a varied perspective. Trained initially as teachers, principals then undergo training related to a variety of areas concerned with all facets of education (transportation, finance, facilities maintenance, law etc.). This varied training causes the principal to assume the role of general manager of the entire facility and the activities which occur within that facility. As general manager of the facility, practical building features that relate to the day-to-day operation of the school were most important to the principal. Because of the experience as teachers and working with teachers on a day-to-day basis, strong affiliations with teachers and teaching exist for principals. Thus, building features which impact on the comfort and safety of the building occupants are ranked highly by principals.

Principals also perceived instruction related building characteristics as most important, but showed a more practical and organizational

mindset. The principal's educational philosophy and leadership role may be affected by teachers and staff, resulting in a strong orientation toward creating building features that make the facility adaptable to changing instructional needs. Regular classrooms, specialized instructional areas and the media center were perceived by principals to be some of the most important building categories. Circulation patterns, proximity, storage, size of space, location of service and instructional areas, workrooms, energy efficiency etc. were some of the items of most concern for principals. These rankings indicate an orientation by principals toward the instructional function and organizational capability of the facility.

Principals agreed closely with teachers in all areas except one. Cost was a more important factor to principals than teachers. Principals ranked cost first among the general design considerations, whereas, teachers ranked cost fifth. This difference may be explained by the specialized training of principals and their budget management responsibilities.

Research Question 3

Research question 3 examined the perceptions of architects relative to a set of building characteristics. It also examined if significant differences exist within this subject group.

The least disagreement within the groups surveyed was among the architect subject group. This group showed moderate to low disagreement in 10 of the 15 categories and low agreement in 2 categories. This maybe explained by the specific training of the architect. Architects disagree least in those areas related specifically to their professional training. This seems to indicate a mindset among architects focusing on the technical aspects of school building.

Architects are trained with a technical mindset when viewing a building design. Architectural design training requires attention to detail and strict adherence to physical principles. Such training may create a common mindset among architects on certain kinds of design features. This could account for lower disagreement values for certain kinds of building features. This technical outlook carries over to the design of school structures. The data in this study reinforce the areas of most agreement among architects to be the more technical characteristics. This technical mindset seems to produce the same characteristics over and over in facility design regardless of the function. Thus, school facilities often are adaptations of other institutional structures such as hospitals, government buildings, and even prisons. Many times, one school design plan is simply used over and over.

Technical aspects were included in the rankings by architects. Location of service and instructional areas, isolation of noise-producing activities, natural lighting, dependability of environmental control, location of the gymnasium, size of spaces, temperature control etc. were some of the items of most concern to the architects. Those responses may indicate an orientation by architects toward the functional efficiency of the facility and spatial relationships of the designed building components.

It is interesting that those categories of most disagreement among architects include those most related to educational philosophy or technique such as service and curriculum delivery. Architects seem to share a feeling with teachers and principals that instruction is important, but does not fully understand the philosophy and history of instruction. Thus, the activities that take place within the structure are little understood by the architects who have little formal training in instruction.

Without formal training as educators, architects are forced to speculate about the importance of instructional features or listen to others when developing designs for school facilities. Architects are at the mercy of their sources of information. Those sources have typically been the school boards, office of the superintendent or other non-instruction personnel at the central office or state department level.

The primary source of information for building specifications for a new facility stems from those written through the education specifications process required by state departments of public instruction. This process may also have affected the architects designs. Information collected at the grass roots level in education may be transformed and filtered by the bureaucracy as it moves up the bureaucratic pyramid. The resulting specifications may be far from what the classroom teacher or principal originally envisioned. The result is a dissatisfaction among teachers and principals before the building is even complete. A feeling of ownership in the new structure may be lost in feelings of neglect, mistrust and bitterness.

Research Question 4

Research question 4 examined the perceptions of each respondent group relative to a set of 13 building categories. It also examined if significant differences exist within these subject groups on the 13 building categories. The 13 building categories were surveyed using two questions, 14 and 15. Accuracy of the data and manageability for the subjects was enhanced by the two question format. Question 14 included those categories concerned with delivery of services and curriculum to the students.

Question 15 included those categories concerned with the general design of the facility.

Responses relating to Category 14, service and curriculum delivery, showed some very interesting results. In 5 of the 7 items in this question the rankings for teachers and principals were exactly the same. The two items which differed were simply reversed in ranking by the two subject groups. The teachers ranked media center fourth and student service areas third, while the principals ranked media center third and student service areas fourth. The overall rankings of the items were extremely close. In addition, this category produced one of the lowest levels of disagreement within the teacher group and within the principal group.

Delivery of instruction to the students was the main concern of the teacher and principal groups. Items concerned with school functions other than instruction were ranked lower by both teachers and principals. The consistency of rankings and lower levels of disagreement for teachers and principals for question 14 indicated an orientation toward building features that facilitate the instructional process.

Architects showed differences from teachers and principals in the rankings of the 7 items in Category 14. The only items of consensus were items 6 and 7. In addition architects showed one of the highest disagreement levels within any group on question 14. Examination of the architect rankings indicated that architects are oriented toward building features that facilitate instruction, but those rankings were inconsistent with the rankings of the other subject groups. Combined with a high level of disagreement within the architect group, the indication was that architects' perceptions of this item differ from that of teachers and principals.

Question 15 addressed the remaining 6 building considerations which were concerned with the general design of a school facility. Responses to this question revealed less consistency in the rankings of the three subject groups.

Teachers ranked highest those items with a direct impact on the delivery of instruction and ranked lowest those items with limited impact on instruction. Flexibility, environmental control and acoustical treatment were ranked high by teachers; while professional features , total cost and aesthetics were ranked lower. The teacher responses produced the highest level of disagreement of the three subject groups caused perhaps by the lack of formal training and a limited knowledge base of general design features of a facility.

The principals' rankings for question 15 did not reveal any clear pattern of responses. Total cost, flexibility and environmental control ranked high; while professional features, acoustical treatment and aesthetics ranked lower for principals. Principals, as did teachers, showed a high level of disagreement in their opinions. This similarity to teachers suggested that principals also had little formal training or knowledge base of general design features of a facility.

Architect rankings for question 15 showed a more groups. Flexibility, environmental control and total cost were ranked high by architects; while professional features, acoustical treatment and aesthetics were ranked lower. This ranking pattern indicates a more practical view of question 15. Instructional delivery was not primary to architects, as they were more concerned with the functional integrity of the design. The lowest level of disagreement for question 15 was the architect W value, which was higher

than any other group. As discussed previously, training plays an important role in the architects mindset and perspective on question 15.

Disagreement exists in all the three groups surveyed and must be acknowledged in design features. The strength of this disagreement varies considerably within and between groups. It is a product of many factors which may include educational philosophy, training, standards, socio-economic status, experience and many other factors. Thus, it may be suggested that every educational design should be produced with a view to the goals of education in mind. Particular emphasis should be placed on those who work and learn within the facility. It is hard to imagine any one school design which meets the needs of all concerned. Thus, designers must include various user groups in the design process in order to obtain a "goodness of fit".

Research Question 5

Research question 5 examined the rankings of teachers, principals and architects combined, for the same set of middle school building characteristics, to determine if significant within group differences exist for the combined group.

The combined rankings analysis for research question 5 supports the supposition that different perspectives of the subject groups creates significant differences in the item rankings. The Kendall Coefficient of Concordance values for the combined groups showed highly significant differences in opinions by the combined respondent rankings for all 15 categories.

The combined rankings of all subjects produced strength of disagreement in the Moderate range for 3 categories; Fairly High

Disagreement for 5 categories; High Disagreement for 4 categories and Very High disagreement for 3 categories. When individual subject groups were examined for strength of disagreement in research questions 1, 2 and 3, there were 14 coefficient of concordance values in the low agreement to moderate disagreement range. None of the combined rankings produced coefficient levels in the low agreement or low disagreement range. This illustrates that, as might be expected, the level of disagreement increased when all subjects were analyzed together.

An item-by-item analysis was made of the subject groups to gather some insight into the differences suggested. The teacher / principal comparison showed that of the 15 total categories, comprising 78 items, the teachers and principals mean ranks agreed on 50 of the 78 for a overall 64% agreement. Significant disagreement exists between the teachers and principals, even though they showed the highest level of agreement on mean ranks. The source of this agreement appeared to be in building features related to the delivery of instruction. Building features which have a more indirect relation to instruction produced lower rankings and greater disagreement by teachers and principals. The suggestion is that teachers and principals view many building features from a common perspective.

Teachers and principals are concerned with the instruction of students. School design features to accomplish this primary goal of instruction are the most important to them. The educational facility design features needed by the teacher and principal are derived from their extensive knowledge of instructional theory and technique. In addition, the teacher and principal draw on their personal needs which must be met by the facility. These include professional features or the feeling of ownership

by real inclusion in the design process. Many characteristics of a facilities design are unique to the activities to be performed within the structure.

Teachers and principals ranked as most important to them practical everyday items related to teaching and educating students. Many of the school facilities designs of the past are adaptations or even replication of a previously used design. Most often, the driving force for such designs are profit margins not sound educational practice.

The principal / architect comparison showed that of the 15 total categories, comprising 78 items, the principals and architects mean ranks agreed on 38 of the 78 for an overall 49% agreement. Thus, significant disagreement existed between the principals and architects even though they showed the second lowest level of disagreement on mean ranks. There appears to be no clear trend to the disagreement of principals and architects indicating no overall common perspective of these two groups. Multiple use areas, circulation patterns, storage and shelving, inclusion of instructional areas in the gymnasium and design and planning cost are some of the items showing wide differences in rankings by principals and architects. The disagreement by principals and architects was a major factor in the overall disagreement values for the combined subjects.

Principals and architects showed agreement on more items than architects and teachers. A large difference still existed between the architects and principals, but it is measurably less than the difference between the architects and teachers. Areas concerning professional characteristics and the environment were stronger in agreement for the architects and principals than the architects and the teachers.

The architect / teacher comparison showed that of the 15 categories, comprising 78 items, the architects and teachers mean ranks agreed on 31 of the 78 for an overall 40% agreement. Thus significant disagreement existed between the teachers and architects with the lowest level of agreement on the mean ranks being shown for this group comparison. Consistent disagreement occurred for items that impact most directly on instruction. Sound proofing, natural lighting, storage and shelving, professional library, temperature control in each room and student service areas are some of the items showing wide differences in rankings by teachers and architects. The disagreement by architects and teachers was the greatest contributor to the overall disagreement values for combined subjects.

Of all the comparison groups, architects and teachers showed the strongest disagreement on the 15 categories. Architects try to be sensitive to the teaching process, but they are not trained in even the basics of instruction and instructional design. They show strong disagreement in this area of the school facilities planning. Architects do have technical training in areas concerned with general design and show relative strength of agreement in these areas. Teachers are not trained in the area of general design and show most disagreement in these areas.

The principal / teacher / architect comparison showed that of the 15 categories comprising 78 items the principal, teacher and architect mean ranks agreed on 27 of the 78 items for a overall 35% agreement. Thus, significant disagreement exists between the three groups with the lowest level of agreement on mean ranks apparent in this comparison. Acoustical treatment, regular classrooms, professional aspects, environmental

control, gymnasium and cost were items showing wide differences in rankings by teachers, principals and architects.

The primary concern of this study was to determine if significant differences of perception exist on a set of building characteristics for a new middle school for the three subject groups. Results of the study strongly support the existence of such significant differences. All groups, with few exceptions, disagreed with varying strength on all 15 categories in the study.

An examination of the literature failed to locate any study in which the perceptions of teachers, principals and architects on school building considerations were compared. The only study which endeavors to examine such building considerations for similar subject groups is the companion study by Marvin Chapman: "A Comparative Analysis of the Importance of Elementary School Building Characteristics to Teachers, Principals and Architects".

The Chapman (1991) results, along with this study, strengthen the conclusions presented previously. Planners and designers may find the results of this study useful in developing plans and specifications for new school facilities. Those who wish to incorporate the expertise of both users and school facility design experts may be able to build on the knowledge base begun by this study and the Chapman study.

One of the goals of this study was to develop insight into the perceptions of middle school teachers, middle school principals and architects. These three groups are professionals with close connections to the school facility. The inclusion of these groups in facility design may be critical to many reform ideas. The current educational reform movement has placed emphasis on restructuring schools from the bottom to top.

Several important aspects of this reform include new management techniques such as "site-based management" and "consensus building". Another important aspect of educational reform will be "professionalizing education". Success of these reforms may be enhanced if teachers, principals and other education personnel are included in decision making.

Implications and Recommendations

The implications of varied and strong disagreement in building design considerations within and between the three subject groups may be very important in future educational reform. Educational reforms literature suggest new management techniques. Site-based management is currently the most discussed technique. The status of those who are directly involved with the educational process may be elevated if such site based management is implemented. Education personnel are being asked to become more involved in the decision making process. Wisdom and prudence may demand the recognition of the opinions of teachers and principals as well as design experts when new educational facilities are planned. Thus the study results indicated that this may not be the case . Very significant differences were apparent in the building category items in this study.

Presently, school facilities are being designed incorporating only superficially the ideas and concerns of those who will use the space. The resulting designs may be mechanically sound and perhaps even appealing to look at, but do not really provide the facility characteristics to achieve the established educational goals. Considering the variation in perceptions of teachers, principals and architects it seems improbable that the existing structures or newly designed ones include all the necessary features to

meet established educational goals. The day of the "generic school plan" has ended.

New school reforms are transforming old expectations of educational management and planning. New curriculum and technological innovations have added new pressures to already strained school facilities. In addition educators are being asked to take on more and more the nurturing role once the parental domain. Traditional facilities are not designed to accommodate these new demands. Rather than allowing for creative and new techniques of instruction (initiated by reforms), the facilities at present act as impediments to them. Thus, it is important to create facilities which can meet the varied demands of education and socialization.

The present technique used design schools is to have some individual to write the educational specifications based on expert knowledge of general building considerations and the state department codes. At best, the process gathers information at the lower levels of the bureaucracy about educational specifications, then, moves it up the bureaucratic pyramid to the level at which decisions are made relative to buildings. This level is typically the office of the superintendent or school board. Then the specifications are given to the architect to design the facility. This technique creates misconceptions about details because of the filtering of design characteristics as they move up the hierarchy. This filtering distorts the original recommendations, resulting in unrealistic and often unsatisfactory features or specifications. Thus, the architects design may not include some important features to teachers, principals and other important groups. There must be a return to the philosophy of "form follows function".

Facilities design with a top down mentality or bureaucratic orientation will only compound already existing problems. These designs produce physical environments and availability of facilities which directly affect teaching and the learning experiences schools may provide. Thus, teachers and principals at the site based level must have a leading role in facilities design, along with other important groups including students, parents, central office staff and school boards.

Another reform issue related to facilities involves a consensus approach to planning and decision making. A consensus approach to designing educational facilities must be developed. Consensus building before ground breaking even begins on the facility has the effect of decreasing negative feelings and increasing positive feelings about the final facility. It also insures that the design and planning phase has been extensive and complete. This makes for an efficient and more economical design in which all users have pride. Another benefit of such a decision process could be an atmosphere of professional respect leading to further advocacy of the process in other planning situations.

This consensus approach holds many implications for the existing educational specifications process in North Carolina and perhaps other states as well. Effective tools for developing educational specifications will be needed. Planning guides should provide methods for school planners to express opinions about what building considerations are important to them. Such information will be vital in making informed and objective decisions about designs.

Revision of the instrument used in the Chapman / Miller study and expansion of its basic categories to be more comprehensive or specific as needed could be a foundation on which to develop specifications

instruments. Such instruments may assist in the difficult task of gathering information for facilities designing and planning. Only by obtaining the most complete and detailed information available, regarding facility needs, will the most efficient and cost effective facility be developed.

Effective school planning by professionals from varied disciplines including education and architecture should reduce the normal limitations imposed by budget restrictions. Instead of designing a facility that is a wish list of many varied groups, and then revising it without the groups' input because of cost limitations, teachers, principals and architects should combine their expertise to develop a design that meets both cost constraints and educational requirements.

The implication may be for a new design process where the planners and designers of the facility interface with the users directly at the grassroots level. An example of such a technique may be found in the design and planning of the First Ward School in Charlotte, North Carolina.

Designers and planners must begin to listen to those who are intimately involved with the use of the space designed. The goal must be to design a facility that provides the best possible opportunities for teachers, principals and students to attain the goals of education in a comfortable, secure and safe environment. A facility that is conducive to the styles and philosophies of instruction of each staff member and allows for feelings of ownership and pride in the facility may go far to improving the quality of instruction and satisfaction of those who use the facility. One good idea might be to personalize spaces in a design by including the user in decorating decisions. Even small, less costly items may help develop pride and positive feelings about the structure and enhance instruction.

Professionalization of education may be another key issue of future reform. The implications of this study for the professionalization of education comes from its evidence of significant differences existing in teachers, principals and architects perceptions of important characteristics of a new school facility. Professional characteristics specific to the facility, such as offices, professional library, telephone access etc. were not ranked highly by any group as a category. Thus, it seems that teachers and principals are not interested in professional features which might professionalize education in the physical sense. Professionalization, however, is more than just physical trappings. It is a state of mind in which them professionals feel confident and accepted in their field of endeavor. Professionals are considered experts in their fields of expertise and are listened to by those outside of the profession on decisions concerned with these fields. It seems that this was not the case if one examines the results of this study. Teachers and principals may perceive that they are often held in contempt by those in the decision making roles of education. Input in all areas including facilities design, may be a necessity for creating the mindset to develop education professionals.

Much as in Maslow's hierarchy of needs, I believe that educators must have the basic instructional delivery needs fulfilled before they can rise to the more professional level. This study implies that these basic needs may not have been met in the past. The facility is only a part of the whole picture, but it is the frame into which the activities of instruction must be placed. If there is not a "goodness of fit" of the facility with the instructional activities within it, the educational activities will be distorted by the frame into which they are placed. This may create job dissatisfaction, educational

discord and poor instruction, which impedes the progress toward educational goals.

Another recommendation resulting from this study concerns establishing short and long range goals. These goals should be determined and then the facilities planned and designed to provide the best possible opportunity for educators to meet them. In the design processes of many institutional facilities such as schools, we have strayed from the tenet of design that "form follows function". We have somehow evolved the philosophy in public school buildings into "function follows form". Educators are trying to use instructional strategies and techniques in facilities that are not conducive to them. The results in this study found highly significant disagreements within and between the subject groups in the area of "instructional spaces", indicating that facilities must be modified or new ones designed which meet established requirements of the professional educator.

More time must be given to the planning and design process to allow for through planning well in advance of ground-breaking. This allows planners and designers to streamline the plan and specifications to meet budget constraints without alienating those who helped design it.

A very important recommendation concerns future studies which might be generated by this study. The tremendous amount of data collected by this endeavor lends itself to further analysis and interpretation for other questions which were not addressed in this study. The researcher had to limit the scope of the research to keep it manageable.

One area of interest in the existing data might be demographics. Comparisons of perceptions based on experience, gender, race or age might yield some useful results, as might comparisons of geographic locations or

school size. Many further questions could be answered with the existing data. These data will have to wait for an enterprising student of facilities to analyze.

New data might be developed if other subject groups are surveyed. It would be of enormous value in building the knowledge base to look at other subject groups such as,students, parents, central office staff, board members and superintendents. These groups need to be surveyed as to their perceptions on the same set of middle school building characteristics.

The basic ground work has been done to open up a new area of facility design to scrutiny. It will be the responsibility of planners, designers and facilities researchers to begin to build a body of knowledge which can benefit facility design decisions and specifications processes. The school facility establishes an educational environment which shapes to some extent the experiences and instructional practices encountered by the students, teachers and others who use the facility. The design of a school should provide the physical environment for education professionals, including teachers and principals, to fulfill the educational mandate which society has placed upon them. Only by capitalizing on each others' expertise may architects and educators be able to improve the design of schools in the future to most efficiently meet the demands placed on them by society.

Several key recommendations have resulted from this study. In summary these are:

1. Recognition of the opinions of teachers and principals in designing and planning.
2. Site-based management techniques should be encouraged.
3. A consensus approach to designing and planning should be encouraged to foster feelings of ownership.

4. Effective instruments need to be developed for gathering information about design features.

5. Direct contact of the designers, planners and users of the facility.

6. Allowing for the users to personalize spaces by inclusion in decorating and furnishing.

7. Meet the most basic needs of instruction for all users first.

8. A return to the philosophy of "form follows function".

9. Allocation of sufficient time to allow for the evolution of the design before ground breaking is begun.

10. Continuation of research in this area of facilities design to build the knowledge base.

Many questions remain to be answered about facilities design and the planning process. Some of these questions include:

1. How long does such a site-based, consensus building approach take to develop a design?

2. How does such a planning process impact cost?

3. What features of a design may act as dissatisfiers for teacher morale?

4. What features of a design act as morale builders?

5. Which groups have the most input into facility design and planning?

APPENDIX A
TEACHER, PRINCIPAL AND ARCHITECTS BUILDING CHARACTERISTICS DATA TABLES TABLES 1 - 19

Table 1

Mean Importance Rank and Item Rank of School Building Characteristics by Teachers, Principals, and Architects

Category 1: Site Selection

	Subject							
	Teachers		Principals		Architects		Combined	
Item Description	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
1a Proximity	2.10	1	2.03	1	2.72	1	2.19	1
1b Accessibility	2.61	2	2.83	2	2.85	2	2.70	2
1c Size of Site	2.75	3	2.89	3	3.09	4	2.84	3
1d Utilities available	3.20	4	3.20	4	3.00	3	3.17	4
1e Topography and soil	4.34	5	4.05	5	3.34	5	4.09	5
Kendall Coefficient	W=0.2853		W=0.2117		W=0.0227		W=0.1982	
Degrees of Freedom	4		4		4		4	
Significance	0.0000		0.0000		0.3068		0.0000	
Total usable surveys	176		64		53		293	

Table 2

Mean Importance Rank and Item Rank of School Building Characteristics by Teachers, Principals, and Architects

Category 2: Flexibility

	Subject							
	Teachers		Principals		Architects		Combined	
Item Description	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
2a Movable walls	4.55	5	4.63	5	4.42	5	4.54	5
2b Allows for growth	1.93	1	2.34	1	2.34	1	2.09	1
2c Multiple use areas	2.94	4	2.63	2	3.26	4	2.93	4
2d Adaptable to tech.	2.72	2	2.70	3	2.62	3	2.70	2
2e Additions possible	2.86	3	2.70	3	2.36	2	2.73	3
Kendall Coefficient	W=0.3667		W=0.3388		W=0.3062		W=0.3374	
Degrees of Freedom	4		4		4		4	
Significance	0.0000		0.0001		0.0000		0.0000	
Total usable surveys	177		64		53		294	

Table 3

Mean Importance Rank and Item Rank of School Building Characteristics by Teachers, Principals, and Architects

Category 3: Acoustical Treatment

	Subject							
	Teachers		Principals		Architects		Combined	
Item Description	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
3a Carpeting	3.71	5	3.64	5	4.06	5	3.76	5
3b Sound proofing	2.34	1	2.95	3	3.25	4	2.64	1
3c Circulation patterns	2.69	2	2.46	1	3.13	3	2.73	3
3d Isolation of noise	2.80	3	2.58	2	1.61	1	2.53	2
3e Sound dampening in noisy areas	3.47	4	3.34	4	2.95	2	3.35	4
Kendall Coefficient	W=0.1287		W=0.0975		W=0.3126		W=0.1115	
Degrees of Freedom	4		4		4		4	
Significance	0.0000		0.0940		0.0000		0.0000	
Total usable surveys	177		64		54		295	

Table 4

Mean Importance Rank and Item Rank of School Building Characteristics by Teachers, Principals, and Architects

Category 4: Regular Classrooms

	Subject							
	Teachers		Principals		Architects		Combined	
Item Description	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
4a Standardization	2.91	2	2.80	2	3.24	3	2.95	3
4b Natural lighting	3.14	4	3.21	4	2.09	1	2.96	4
4c Available wet area	3.58	5	3.38	5	3.44	5	3.51	5
4d Varying size rooms	2.95	3	2.88	3	2.95	2	2.94	2
4e Storage and shelving	2.41	1	2.73	1	3.29	4	2.65	1
Kendall Coefficient	W=0.0709		W=0.0310		W=0.1160		W=0.0391	
Degrees of Freedom	4		4		4		4	
Significance	0.0000		0.0000		0.0000		0.0000	
Total usable surveys	176		64		55		295	

Table 5

Mean Importance Rank and Item Rank of School Building Characteristics By Teachers, Principals, and Architects

Category 5: Specialized Instructional Areas

	Subject							
	Teachers		Principals		Architects		Combined	
Item Description	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
5a Isolation	4.24	5	4.16	5	4.48	5	4.26	5
5b Specialized design	2.37	1	1.97	1	2.04	1	2.22	1
5c Adaptable to changes	2.49	2	2.46	2	2.11	2	2.41	2
5d Size of space	2.60	3	2.94	3	2.74	3	2.70	3
5e Storage	3.31	4	3.48	4	3.63	4	3.41	4
Kendall Coefficient	W=0.2453		W=0.2924		W=0.4376		W=0.2808	
Degrees of Freedom	4		4		4		4	
Significance	0.0000		0.0000		0.0000		0.0000	
Total usable surveys	177		64		54		295	

Table 6

Mean Importance Rank and Item Rank of School Building Characteristics by Teachers, Principals, and Architects

Category 6: Administrative Areas

	Subject							
	Teachers		Principals		Architects		Combined	
Item Description	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
6a Size of office	2.58	1	2.16	1	2.07	1	2.39	1
6b Record storage	3.29	4	3.77	5	3.47	4	3.43	5
6c Conference room	2.88	3	3.31	4	3.60	5	3.11	3
6d Secretary work area	2.75	2	2.61	2	2.54	2	2.68	2
6e Reception area	3.50	5	3.16	3	3.32	3	3.39	4
Kendall Coefficient	W=0.0589		W=0.1573		W=0.1778		W=0.0818	
Degrees of Freedom	4		4		4		4	
Significance	0.0000		0.0000		0.0000		0.0000	
Total usable surveys	177		64		53		294	

Table 7

Mean Importance Rank and Item Rank of School Building Characteristics by Teachers, Principals, and Architects

Category 7: Media Center

	Subject							
	Teachers		Principals		Architects		Combined	
Item Description	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
7a Central location	1.88	1	1.52	1	1.44	1	1.72	1
7b Open space	2.63	2	2.59	2	2.00	2	2.51	2
7c Computer area	3.20	3	3.42	4	3.65	3	3.33	3
7d Separate screening / instruction room	3.49	4	4.09	5	4.17	5	3.74	5
7e Equipment storage	3.80	5	3.38	3	3.74	4	3.70	4
Kendall Coefficient	W=0.2309		W=0.3883		W=0.5750		W=0.3029	
Degrees of Freedom	4		4		4		4	
Significance	0.0000		0.0000		0.0000		0.0000	
Total usable surveys	176		64		54		294	

Table 8

Mean Importance Rank and Item Rank of School Building Characteristics by Teachers, Principals, and Architects

Category 8: Aesthetics / Appearance

	Subject							
	Teachers		Principals		Architects		Combined	
Item Description	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
8a Uniqueness of design	4.03	5	4.02	5	4.21	4	4.06	5
8b Building in harmony with environment	2.22	1	1.64	1	1.47	1	1.96	1
8c Furniture blends with design	3.30	4	3.55	4	4.26	5	3.53	4
8d Attractive materials	3.06	3	3.09	3	2.79	3	3.02	3
8e Appealing materials	2.39	2	2.70	2	2.26	2	2.43	2
Kendall Coefficient	W=0.2146		W=0.3275		W=0.5977		W=0.2811	
Degrees of Freedom	4		4		4		4	
Significance	0.0000		0.0000		0.0000		0.0000	
Total usable surveys	176		64		53		293	

Table 9

Mean Importance Rank and Item Rank of School Building Characteristics by Teachers, Principals, and Architects

Category 9: Professional Features

	Subject							
	Teachers		Principals		Architects		Combined	
Item Description	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
9a Teacher office	3.09	3	3.02	3	3.19	4	3.09	3
9b Telephone in classroom	3.31	4	3.97	5	4.24	5	3.63	5
9c Professional library	3.95	5	3.34	4	2.81	3	3.61	4
9d Teacher workroom	2.43	2	2.28	1	2.09	1	2.34	2
9e Access to office equipment	2.21	1	2.39	2	2.67	2	2.33	1
Kendall Coefficient	W=0.1969		W=0.1945		W=0.2543		W=0.1662	
Degrees of Freedom	4		4		4		4	
Significance	0.0000		0.0000		0.0000		0.0000	
Total usable surveys	175		64		54		293	

Table 10

Mean Importance Rank and Item Rank of School Building Characteristics by Teachers, Principals, and Architects

Category 10: Student Service Areas Including Restrooms, Health Room, Guidance, Cafeteria, Entry, Circulation, and Commons Area

	Subject							
	Teachers		Principals		Architects		Combined	
Item Description	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
10a Location	1.89	1	1.71	1	1.74	1	1.82	1
10b Durability	2.74	3	2.92	3	3.09	3	2.84	3
10c Ease of maintenance	3.42	4	3.36	4	3.33	4	3.39	4
10d Suitability for community use	4.33	5	4.18	5	3.83	5	4.20	5
10e Size of space	2.63	2	2.83	2	3.00	2	2.74	2
Kendall Coefficient	W=0.3385		W=0.3221		W=0.2400		W=0.3084	
Degrees of Freedom	4		4		4		4	
Significance	0.0000		0.0000		0.0000		0.0000	
Total usable surveys	175		64		54		293	

Table 11

Mean Importance Rank and Item Rank of School Building Characteristics by Teachers, Principals, and Architects

Category 11: Environmental Control

	Subject							
	Teachers		Principals		Architects		Combined	
Item Description	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
11a Noise	3.27	4	3.72	5	3.80	5	3.46	4
11b Energy efficiency	2.89	3	2.38	1	2.47	2	2.70	2
11c Ease of maintenance	3.84	5	3.09	3	3.19	3	3.56	5
11d Temperature control in each room	2.47	1	3.20	4	3.44	4	2.81	3
11e Dependability	2.54	2	2.60	2	2.10	1	2.47	1
Kendall Coefficient	W=0.1286		W=0.1107		W=0.1953		W=0.0930	
Degrees of Freedom	4		4		4		4	
Significance	0.0000		0.0000		0.0000		0.0000	
Total usable surveys	176		64		54		294	

Table 12

Mean Importance Rank and Item Rank of School Building Characteristics by Teachers, Principals, and Architects

Category 12: Gymnasium

	Subject							
	Teachers		Principals		Architects		Combined	
Item Description	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
12a Location	2.51	2	2.41	2	2.28	1	2.45	2
12b Dressing rooms / showers	2.99	4	3.11	4	3.02	3	3.02	3
12c Suitability for community use	4.35	5	4.27	5	3.52	4	4.18	5
12d Inclusion of areas for instruction	2.99	4	3.06	3	3.00	5	3.13	4
12e Size of space	2.16	1	2.16	1	2.54	2	2.23	1
Kendall Coefficient	W=0.2760		W=0.2682		W=0.1425		W=0.2303.	
Degrees of Freedom	4		4		4		4	
Significance	0.0000		0.0000		0.0000		0.0000	
Total usable surveys	175		64		54		293	

Table 13

Mean Importance Rank and Item Rank of School Building Characteristics by Teachers, Principals, and Architects

Category 13: Cost of School Facility

	Subject							
	Teachers		Principals		Architects		Combined	
Item Description	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
13a Site cost	3.14	4	3.16	4	2.65	2	3.09	3
13b Materials cost	2.97	2	3.08	3	2.81	3	2.96	2
13c Design and planning cost	3.10	3	3.02	2	4.28	5	3.30	4
13d Size of facility	2.25	1	2.23	1	1.63	1	2.13	1
13e Cost of special features	3.55	5	3.52	5	3.43	4	3.52	5
Kendall Coefficient	W=0.0900		W=0.0883		W=0.3748		W=0.1126	
Degrees of Freedom	4		4		4		4	
Significance	0.0000		0.0002		0.0000		0.0000	
Total usable surveys	175		64		54		293	

Table 14

Mean Importance Rank and Item Rank of School Building Characteristics by Teachers, Principals, and Architects

Category 14: Design for Service and Curriculum Delivery

	Subject							
	Teachers		Principals		Architects		Combined	
Item Description	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
14a School site	4.18	5	4.83	5	3.86	4	4.27	5
14b Regular classrooms	1.99	1	1.84	1	3.41	2	2.20	1
14c Specialized areas	3.36	2	3.30	2	3.65	3	3.40	2
14d Administrative areas	5.63	7	5.41	7	5.08	7	5.49	7
14e Media center	3.87	4	3.46	3	3.02	1	3.64	3
14f Student service areas	3.83	3	4.08	4	3.96	5	3.91	4
14g Gymnasium	5.14	6	5.06	6	5.02	6	5.10	6
Kendall Coefficient	W=0.3024		W=0.3299		W=0.1306		W=0.2564	
Degrees of Freedom	6		6		6		6	
Significance	0.0000		0.0000		0.0000		0.0000	
Total usable surveys	174		63		49		286	

Table 15

Mean Importance Rank and Item Rank of School Building Characteristics by Teachers, Principals, and Architects

Category 15: General Design of a School

	Subject							
	Teachers		Principals		Architects		Combined	
Item Description	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
15a Environmental control	3.09	2	3.14	3	3.41	3	3.16	2
15b Flexibility of design	2.42	1	2.20	2	2.06	1	2.31	1
15c Acoustical treatment	3.71	3	3.84	5	4.85	6	3.95	5
15d Aesthetics or Appearance	4.13	6	3.95	6	3.74	4	4.02	6
15e Professional features	3.74	4	3.83	4	4.03	5	3.81	4
15f Total cost of facility	3.90	5	2.03	1	2.91	2	3.75	3
Kendall Coefficient	W=0.1142		W=0.1443		W=0.2621		W=0.1242	
Degrees of Freedom	5		5		5		5	
Significance	0.0000		0.0000		0.0000		0.00000	
Total usable surveys	174		64		54		292	

Table 16

Middle School Building Considerations Categories in Order of Agreement from Highest Agreement to Lowest Agreement

Subject Group: Middle School Teachers

Category	W-Value
02 Flexibility	0.3667
10 Student Service Areas	0.3385
14 Service and Curriculum Delivery	0.3024
01 School Site	0.2853
12 Gymnasium	0.2760
05 Specialized Instructional Areas	0.2453
07 Media Center	0.2309
08 Aesthetics / Appearance	0.2146
09 Professional Features	0.1969
03 Acoustical Treatment	0.1287
11 Environmental Control	0.1286
15 General Design	0.1142
13 Cost of the Facility	0.0900
04 Regular Classrooms	0.0709
06 Administrative Areas	0.0589

Table 17

Middle School Building Considerations Categories in Order of Agreement from Highest Agreement to Lowest Agreement

Subject Group: Middle School Principals

Category	W-Value
07 Media Center	0.3883
02 Flexibility	0.3388
14 Service and Curriculum Delivery	0.3299
08 Aesthetics / Appearance	0.3275
10 Student Service Areas	0.3221
05 Specialized Instructional Areas	0.2924
12 Gymnasium	0.2682
01 Site Selection	0.2117
09 Professional Features	0.1945
06 Administrative Areas	0.1573
15 General Design	0.1443
11 Environmental Control	0.1107
03 Acoustical Treatment	0.0975
13 Cost of the Facility	0.0883
04 Regular Classrooms	0.0310

Table 18

Middle School Building Considerations Categories in Order of Agreement from Highest Agreement to Lowest Agreement

Subject Group: Architects

Category	W-Value
08 Aesthetics / Appearance	0.5977
07 Media Center	0.5750
05 Specialized Instructional Areas	0.4376
13 Cost of the Facility	0.3748
03 Acoustical Treatment	0.3126
02 Flexibility	0.3062
15 General Design	0.2621
09 Professional Features	0.2543
10 Student Service Areas	0.2400
11 Environmental Control	0.1953
06 Administrative Areas	0.1778
12 Gymnasium	0.1425
14 Service and Curriculum Delivery	0.1306
04 Regular Classrooms	0.1160
01 Site Selection	0.0227

Table 19

Middle School Building Considerations Categories in Order of Agreement from Highest Agreement to Lowest Agreement

Subject Group: All Subjects Combined

Category	W-Value
02 Flexibility	0.3374
10 Student Service Areas	0.3084
07 Media Center	0.3029
08 Aesthetics / Appearance	0.2811
05 Specialized Instructional Areas	0.2808
'14 Service and Curriculum Delivery	0.2564
12 Gymnasium	0.2303
01 Site Selection	0.1982
09 Professional Features	0.1662
15 General Design	0.1242
13 Cost of the Facility	0.1126
03 Acoustical Treatment	0.1115
11 Environmental Control	0.0930
06 Administrative Areas	0.0818
04 Regular Classrooms	0.0391

APPENDIX B
COMPARISON GROUPS BY LIKE PAIRS
TABLES 20 - 23

Table 20

Items of Agreement and Disagreement for All Categories and Matched Subject Groups

Comparison Groups			
	Teachers / principals		
Category	Agree	Disagree	%-Agree
01 Site Selection	5	0	100
02 Flexibility	3	2	60
03 Acoustical treatment	2	3	40
04 Regular classrooms	5	0	100
05 Special classrooms	5	0	100
06 Administrative areas	2	3	40
07 Media Center	2	3	40
08 Aesthetics	5	0	100
09 Proffessional features	1	4	20
10 Student service	5	0	100
11 Environmental control	1	4	20
12 Gymnasium	4	1	80
13 Cost	3	2	60
14 Service and curriculum	5	2	71
15 General design	2	4	33
Totals	50	28	64

Table 21

Items of Agreement and Disagreement for All Categories and Matched Subject Groups

Comparison Groups			
	Principals / Architects		
Category	Agree	Disagree	%-Agree
01 Site selection	3	2	60
02 Flexibility	3	2	60
03 Acoustical treatment	1	4	20
04 Regular classrooms	1	4	20
05 Special classrooms	5	0	100
06 Administrative areas	3	2	60
07 Media center	3	2	60
08 Aesthetics	3	2	60
09 Proffessional features	3	2	60
10 Student service	5	0	100
11 Environmental control	3	2	60
12 Gymnasium	0	5	00
13 Cost	2	3	40
14 Service and curriculum	2	5	29
15 General design	1	5	17
Totals	38	40	49

Table 22

Items of Agreement and Disagreement for All Categories and Matched Subject Groups

Comparison Groups

Teachers / Architects

Category	Agree	Disagree	%-Agree
01 Site selection	3	2	60
02 Flexibility	3	2	60
03 Acoustical treatment	1	4	20
04 Regular classrooms	1	4	20
05 Special classrooms	5	0	100
06 Administrative areas	3	2	60
07 Media center	3	2	60
08 Aesthetics	3	2	60
09 Proffessional features	0	5	00
10 Student service	5	0	100
11 Environmental	0	5	00
12 Gymnasium	0	5	00
13 Cost	1	4	20
14 Service and curriculum	2	5	29
15 General design	1	5	17
Totals	31	47	40

Table 23

Items of Agreement and Disagreement for All Categories and Matched Subject Groups

Comparison Groups

Teachers / Principals / Architects

Category	Agree	Disagree	%-Agree
01 Site selection	3	2	60
02 Flexibility	2	3	40
03 Acoustical treatment	1	4	20
04 Regular classrooms	1	4	20
05 Special classrooms	5	0	100
06 Administrative areas	2	3	40
07 Media center	2	3	40
08 Aesthetics	3	2	60
09 Proffessional features	0	5	00
10 Student service	5	0	100
11 Environmental control	0	5	00
12 Gymnasium	0	5	00
13 Cost	1	4	20
14 Service and curriculum	2	5	29
15 General design	0	6	00
Totals	27	51	35

APPENDIX C
THE SURVEY INSTRUMENT AND COVER LETTERS

The Survey Instrument:

DEMOGRAPHIC INFORMATION

Respondent I.D. # _ _ _ _ _ _ _ _ _ _

1.Gender: [ ] Female [ ] Male

2.Race: [ ] White [ ] Black
[ ] Hispanic [ ] Other

3.Years Experience: [ ] 0 to 3 years
[ ] 4 to 13 years
[ ] 14 to 22 years
[ ] 23 to 30 years
[ ] over 30 years

4.School size: [ ] less than -200
[ ] 200 -299
[ ] 300 -499
[ ] over -500

5.Type of school: [ ] Rural
[ ] Urban

6.Location of school: [ ] Coastal
[ ] Piedmont
[ ] Mountain

7.Approx. age of school: [ ] less than - 5 years
[ ] 5 - 9 years
[ ] 10 - 19 years
[ ] 20 - 29 years
[ ] more than - 30 years

BUILDING CHARACTERISTICS CHECKLIST

1. Rank the following considerations related to school site selection from the most important (number 1) to least important (number 5). Do not assign the same rank to more than one item.

   a. _____ Proximity to Students
   b. _____ Accessibility of site (buses and cars)
   c. _____ Size of site
   d. _____ Utilities availability
   e. _____ Topography and Soil Conditions

2. Rank the following considerations related to flexibility of the school structure from the most important (number 1) to the least important (number 5). Do not assign the same rank to more than one item.

   a. _____ Movable interior walls
   b. _____ Allow for increases in student population
   c. _____ Multiple use areas
   d. _____ Adaptability for future technologies
   e. _____ Adaptable to future additions

3. Rank the following considerations related to the acoustical treatment of the school structure from the most important (number 1) to the least important (number 5). Do not assign the same rank to more than one item.

   a. _____ Carpeting
   b. _____ Sound proofing in walls and ceilings
   c. _____ Student circulation patterns
   d. _____ Isolation of noise producing activities
   e. _____ Sound dampening materials in noisy areas

4. Rank the following considerations related to regular classrooms of the school structure from the most important (number 1) to the least important (number 5). Do not assign the same rank to more than one item.

   a. _____ Standardization of classrooms
   b. _____ Natural lighting
   c. _____ Making wet areas (sink) available
   d. _____ Classrooms of varying size
   e. _____ Storage and shelving

5. Rank the following considerations related to specialized instructional areas of the school structure from the most important (number 1) to the least important (number 5). Do not assign the same rank to more than one item.

a. _____ Isolation from other areas
b. _____ Design for specialized instruction
c. _____ Adaptable to changing program needs
d. _____ Size of instructional space
e. _____ Storage for equipment and materials

6. Rank the following considerations related to administrative areas of the school structure from the most important (number 1) to the least important (number 5). Do not assign the same rank to more than one item.

a. _____ Size of office complex
b. _____ Record storage
c. _____ Conference rooms
d. _____ Secretary work space
e. _____ Reception area

7. Rank the following considerations related to the media center of the school structure from the most important (number 1) to the least important (number 5). Do not assign the same rank to more than one item.

a. _____ Central location
b. _____ Open accessible space
c. _____ Computer area included
d. _____ Separate screening room / instructional space
e. _____ Instructional equipment storage

8. Rank the following considerations related to the aesthetics / appearance of the school structure from the most important (number 1) to the least important (number 5). Do not assign the same rank to more than one item.

a. _____ Uniqueness of design
b. _____ Building design in harmony with the environment
c. _____ Furniture which blends with the design
d. _____ Attractive Materials
e. _____ Appealing materials, colors, and textures

9. Rank the following considerations related to the professional features of the school structure from the most important (number 1) to the least important (number 5). Do not assign the same rank to more than one item.

a. _____ Teacher office area apart from the classroom
b. _____ Telephone in classroom or teacher's office
c. _____ Professional library
d. _____ Teacher workroom
e. _____ Access to office equipment (computer, typewriter, copier)

10. Rank the following considerations related to the student service areas of the school structure from the most important (number 1) to the least important (number 5). Do not assign the same rank to more than one item. These include restrooms, health room, guidance, cafeteria, entry, circulation, and commons areas.

a. _____ Location
b. _____ Durability
c. _____ Ease of maintenance
d. _____ Suitability for Community Use
e. _____ Size of space

11. Rank the following considerations related to the environmental control of the school structure (Heating, Cooling, and Ventilation) from the most important (number 1) to the least important (number 5). Do not assign the same rank to more than one item.

a. _____ Noise
b. _____ Energy Efficiency
c. _____ Ease of Maintenance
d. _____ Temperature control in each room
e. _____ Dependability

12. Rank the following considerations related to the gymnasium of the school structure from the most important (number 1) to the least important (number 5). Do not assign the same rank to more than one item.

a. _____ Location
b. _____ Dressing rooms / showers
c. _____ Suitability for Community Use
d. _____ Inclusion of instructional areas
e. _____ Size of Space

13. Rank the following considerations related to the cost of a school facility from the most important (number 1) to least important (number 5). Do not assign the same rank to more than one item.

a. _____ Site Cost
b. _____ Materials Cost
c. _____ Design and Planning Cost
d. _____ Size of Facility
e. _____ Cost of Special Features (technological features, aesthetics, and environmental control).

14. Which of the following items are most important in designing for Service and Curriculum Delivery? Rank from the most important (number 1) to the least important (number 7). Do not assign the same rank to more than one item.

a. _____ SCHOOL SITE
b. _____ REGULAR CLASSROOMS
c. _____ SPECIALIZED INSTRUCTIONAL AREAS FOR EXCEPTIONAL CHILDREN, SCIENCE, COMPUTER EDUCATION, AND ARTS EDUCATION
d. _____ ADMINISTRATIVE AREAS
e. _____ MEDIA CENTER
f. _____ STUDENT SERVICE AREAS (health room, restrooms, guidance, cafeteria, entry, circulation, and commons areas)
g. _____ GYMNASIUM (physical education and community)

15. Which of the following items are most important in the general design of a school? Rank from the most important (number 1) to the least important (number 6). Do not assign the same rank to more than one item.

a. _____ ENVIRONMENTAL CONTROL
b. _____ FLEXIBILITY OF DESIGN
c. _____ ACOUSTICAL TREATMENT
d. _____ AESTHETICS / APPEARANCE
e. _____ PROFESSIONAL FEATURES (faculty offices, equipment, prof. library, etc.)
f. _____ TOTAL COST OF FACILITY

Cover Letter to Architect

Dear Sir:

We are asking for your help in a study that will examine the importance of different school building design considerations. The survey population will be comprised of random samplings of architects, teachers, and principals. The purpose of this study is to compare perceptions of these groups who have a primary interest in the design of a school facility either by direct use (teachers), organization within the facility (principals), or the design of the facility (architects). As we enter a new era in school reform such a study may have far reaching implications.

We ask that the architect in your firm who is most knowledgeable in the area of school design complete the enclosed survey. Participation is voluntary and nonparticipation carries no penalty.

It is very important that the survey be completed and returned in the self-addressed envelope (no cost to the respondent). Your response will be anonymous. Individual respondents or architectural firms will not be identified in the study. The results will be part of a larger composite analysis.

Your opinions are important! Please let us hear from you. Thank you for taking time to complete this survey. Any questions or concerns may be discussed with us by calling the phone numbers below or the Academic Affairs Institutional Review Board of the University of North Carolina at Chapel Hill (phone 919-966-5625). Information concerning results will be available upon request.

Write or call:

Marvin Chapman
4605 Welborne Drive
Sherrills Ford, N.C.
28673

Phone: 704-483-2404

or

Kenny Miller
430 West Front Street
Statesville, N.C.
28677

Phone: 704-871-1724

Sincerely,

Marvin Chapman

Kenny Miller

Follow - up Letter to Principal

Dear Fellow Principal,

About six weeks ago you were sent a packet containing a survey request. I know that the responsibilities and duties of the school day rarely give you time to even read such a survey, let alone complete it. My colleague and I are pursuing Ed. D. degrees through the UNC- Chapel Hill program. The survey is part of our dissertation concerning school facilities. This is entirely our project. We are printing, developing, and mailing this survey at our own expense. As you know we must have a minimum of at least 60% returned to validate the study. At this writing we are not at that point. It is important that we get as many returned as possible since our follow-up resources are limited.

We are asking for your help in a study that will examine the importance of different school building design considerations. The survey population will be comprised of random samplings of architects, teachers, and principals. The purpose of this study is to compare perceptions of these groups who have a primary interest in the design of a school facility either by direct use (teachers), organization within the facility (principals), or the design of the facility (architects). As we enter a new era in school reform such a study may have far reaching implications.As the principal we are asking for your help in administering the survey to your faculty. Participation is voluntary and nonparticipation carries no penalty.

Please give one of the three teacher copies to the first, eighth, and last teachers on your teacher roster. Have the teachers return them to you, in the white envelopes provided, sealed. Along with your completed copy in its envelope we then ask that you put them in the manila self addressed envelope and mail it back (no cost to the respondent).

It is very important that the surveys be completed and returned in the self-addressed envelope. Your response will be anonymous. Individual respondents will not be identified in the study. The results will be part of a larger composite analysis.

Your concerns are important! Please let us hear from you by completing the short checklist. Thank you for taking time to complete this survey.

Any questions or concerns may be discussed with us by calling the phone numbers below or the Academic Affairs Institutional Review Board of the University of North Carolina at Chapel Hill (phone 919-966-5625).

Information concerning results will be available upon request.

Write or call:

Marvin Chapman
4605 Welborne Drive
Sherrills Ford, N.C.
28673
Phone: 704-483-2404

or

Kenny Miller
430 West Front Street
Statesville, N.C.
28677
Phone: 704-871-1724

Sincerely,

Researchers: Marvin Chapman
Kenny Miller

Letter to Teacher

Dear Fellow Educator,

We are asking for your help in a study that will examine the importance of different school building design considerations. The survey population will be comprised of random samplings of architects, teachers, and principals. The purpose of this study is to compare perceptions of these groups who have a primary interest in the design of a school facility either by direct use (teachers), organization within the facility (principals), or the design of the facility (architects). As we enter a new era in school reform such a study may have far reaching implications.

Your principal has given you this packet and we ask that you complete it and return it to the principal. Please place the survey in the white envelope and seal it before returning it. Please do not put your name on the survey instrument. Participation is voluntary and nonparticipation carries no penalty.

It is very important that the survey be completed and returned in the envelope. Your response will be anonymous. Individual respondents will not be identified in the study. The results will be part of a larger composite analysis.

Your concerns are important! Please let us hear from you by completing the short checklist. Thank you for taking time to complete this survey.

Any questions or concerns may be discussed with us by calling the phone numbers below or the AA-IRB (phone 919-966-5625). Information concerning results will be available upon request.

Write or call:

Marvin Chapman
4605 Welborne Drive
Sherrills Ford, N.C.
28673

Phone: 704-483-2404

or

Kenny Miller
430 West Front Street
Statesville, N.C.
28677

Phone: 704-871-1724

Sincerely,

Researchers: Marvin Chapman

Kenny Miller

APPENDIX D
PEARSON PRODUCT MOMENT RELIABILITY DATA

Table 24

The Pearson Product Moment Reliability Data

Category	Description	Pearson Product Value
01	Site selection	0.999
02	Flexibility	0.999
03	Acoustical treatment	0.999
04	Regular classrooms	0.999
05	Special classrooms	0.999
06	Administrative areas	0.999
07	Media center	0.999
08	Aesthetics	0.999
09	Proffessional features	0.999
10	Student service	0.999
11	Environmental control	0.999
12	Gymnasium	0.999
13	Cost	0.999
14	Service and curriculum	0.998
15	General design	0.998

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