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**Nebraska school facilities: Educational adequacy of structures  
and their funding**

**Pool, Dennis L., Ed.D.**

**The University of Nebraska - Lincoln, 1993**

**U·M·I**

300 N. Zeeb Rd.  
Ann Arbor, MI 48106



**NEBRASKA SCHOOL FACILITIES: EDUCATIONAL  
ADEQUACY OF STRUCTURES AND  
THEIR FUNDING**

by

**Dennis L. Pool**

**A DISSERTATION**

**Presented to the Faculty of  
The Graduate College in the University of Nebraska  
In Partial Fulfillment of Requirements  
For the Degree of Doctor of Education**

**Major: Interdepartmental Area of Administration,  
Curriculum and Instruction**

**Under the Supervision of Professor Dorothy Jo Stevens**

**Lincoln, Nebraska**

**May, 1993**

DISSERTATION TITLE

NEBRASKA SCHOOL FACILITIES: EDUCATIONAL ADEQUACY OF

STRUCTURES AND THEIR FUNDING

BY

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**NEBRASKA SCHOOL FACILITIES: EDUCATIONAL  
ADEQUACY OF STRUCTURES OF  
THEIR FUNDING**

**Dennis L. Pool, Ed.D.**

**University of Nebraska, 1993**

**Advisor: Dorothy Jo Stevens**

In 1991, Nebraska school superintendents and building administrators were surveyed to determine their opinions regarding the physical condition and adequacy for student instruction in their school districts.

Superintendents were surveyed regarding their districts' fiscal capacity to maintain and construct school facilities. The survey responses were analyzed and categorized into five indexes: "Class" of Nebraska school district, "Quartile of Valuation/Pupil," "Population Change Category" of 1990 county census, time "Periods of Facility Construction," and instructional type of "Building Category." The Pearson chi square test of independence was used to test for significant differences, and a contingency coefficient was calculated to determine the effect of the differences.

Significant differences were found in the Nebraska administrators' opinions of the condition and adequacy of their school facilities when the facilities were compared by the different categories. Building administrators reported 18 percent of their buildings were overcrowded; 18 percent were "poor" facilities for existing instructional programs; 40 percent prevented or inhibited desired changes in instructional programming; 10 percent of the buildings were not generally free from safety hazards, and 55 percent of the buildings were not completely handicapped accessible.

Significant differences also were found in the responses of superintendents concerning their districts' fiscal capacity for maintenance and construction of facilities. Superintendents in districts where patrons had access to more property valuation/pupil had lower special building or sinking fund levies, less facility bond debt, and a higher rate of confidence in the future fiscal self-reliance for facility needs in their districts. Superintendent responses in counties of increasing population indicated a high need and urgency for facility bond issue referendums, while superintendents in counties experiencing decline had many older buildings in need of replacement and were not as confident of referendum success.



*This dissertation and school facilities project are dedicated to the memory of John Prash. His personal wisdom and guidance were freely given to benefit fellow educators and his many students. He was considered a great friend to education.*

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I will always remember John Prasch, the conversations we had and the advice he gave me. This was his project and he was confident that the completion of this facility study would provide a beginning for further study of school facilities and cause Nebraska's leaders to further examine the inequities of the state's school facilities.

To my three wonderful daughters, Molly, Megan, and Cathy, who gave up many opportunities so that I would complete this degree, thank you and I love you each dearly.

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D.L.P.

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## CHAPTER I

### INTRODUCTION

#### Context of the Problem

The call for school improvement and transformation of the nation's educational programs has caused school leaders to closely examine their infrastructure. In many cases, school superintendents have been faced with placing students and teachers in inadequate buildings due to age, lack of open access, flawed mechanical or structural systems, and overcrowding in some growth areas. To accentuate the problem, there has been a lack of fiscal resources to maintain or replace inadequate facilities in these schools.

The Nation at Risk (National Commission on Excellence in Education, 1983), a report on the status of education in the United States, was instrumental in initiating the education reform movement of the 80's. These school revitalization initiatives, begun in the 1980's, have now moved into the 90's. On April 18, 1991, President Bush presented a broad set of goals for the advancement of education in the United States. By this long range plan, America 2000: An Education Strategy (U. S. Department of Education, 1991), plans were presented to show how community and school personnel can build a better education system for the nation by the year 2000. The goals identified in this educational plan were to be carried out through cooperative initiatives of school system personnel and their private sector partners. The proposed new education system was to meet six goals, ranging from early childhood education, enhanced graduation rates, mathematics and science excellence, to adult literacy. Added to these goals was the



expectation that the nation's schools would meet world class standards (U. S. Department of Education, 1991).

Nebraska leaders have set equally high goals for the education system in the state. Nebraska 2000 is a plan in which the national goals for education are incorporated and the Nebraska response, involvement, and process are identified. The project goals identified are to provide for quality schools for students and to assist in developing a nation of learners through community involvement. The accomplishment of these goals is based upon the Department of Education's High Performance Learning model (Nebraska Department of Education, 1992) and the partnerships of parents, communities, and statewide business-education-government (Nebraska Department of Education, 1991).

While the emphasis of national and state goals has been to improve education with a new focus based on world class standards, little has been mentioned regarding how to bring the schoolhouse into the picture. The national picture of school facilities is bleak. In a national survey by the Education Writers Association, Lewis et al. (1989) indicated that 25 percent of the nation's school buildings were inadequate, 61 percent needed maintenance and repair, 42 percent contained environmental hazards, 25 percent were overcrowded, 43 percent were judged obsolete for current education efforts, and 13 percent were structurally defective.

Results from a national survey of school administrators on November 19, 1991 were released through the office of the American Association of School Administrators (AASA). In this survey, entitled, Schoolhouse in the Red: Cutting Our Losses, researchers reported that five million students

attended classes in substandard buildings (American Association of School Administrators, 1991). The Education Writers Association label of American schools as, "shoddy places for learning" was supported by officials of the American Association of School Administrators. The authors of Schoolhouse in the Red reported the critical issues of the current facility crisis as the generally poor physical condition of the facilities, environmental problems, energy concerns, the void of federal and state leadership, and the inability to adequately finance maintenance of existing and construction of new facilities.

While replacement and maintenance costs grow, funding resources in the school districts become more restricted; thus, available revenue for such projects is decreasing. Fewer dollars than required have been invested in many school districts to maintain their facilities, which has resulted in an increasing deference of maintenance (American Association of School Administrators, 1991). The demand for new school facility construction grows daily. These construction needs have been created by the necessity to replace aging and inadequate facilities and build new facilities to adjust for population changes. The property tax is used in the majority of states to finance facility maintenance and bond issues for major construction projects. Because the reliance on property tax is in contrast to the growing disparity of wealth among school districts, the move away from the use of property taxes for support of local institutions and the potential for financial problems will likely increase.

During the 1991-92 school year, there were 777 public school districts in the State of Nebraska. A significant volume of information is collected by

the Nebraska Department of Education from these school districts for decision and statistical reporting. This information includes student membership, local property valuation, tax levies, personnel assignments, rosters of school board members, and the number of buses. Per pupil costs, used as analysis for comparing school districts' ability to pay for education, are based upon these current collections. Limited financial information is collected by Nebraska Department of Education officials regarding the financial status of facility bond levies, indebtedness, and expenditures. Information about school facility demographics regarding the specific condition of school infrastructures is also absent.

Uerling's (1988) analysis of Nebraska school districts' expenditures for facility and site expenditures, from 1977 to 1986, reflected the decrease in spending over that period. Prasch and Pool (1991) extended this information to include the same data from 1986 through 1990. While the authors did not find a continued state-wide decline in facility and site expenditures, they did establish that the majority of new Nebraska facility expenditures were in counties experiencing population growth. Thus, in counties experiencing a decline in population, there had not been replacements of aging facilities (Prasch & Pool, 1991).

Clearly, little reliable data have been available regarding the condition of Nebraska school facilities. Without a valid and complete information base, Nebraska decision makers have been forced to base their judgments on incomplete information or to rely upon their sense of the circumstances of local school district infrastructure.

### Purpose of the Study

The purpose for conducting this study was to establish an initial Nebraska public school facilities inventory. The results of this inventory were used to describe the condition of Nebraska school facilities during the 1991-92 school year. Second, an analysis of the inventory was used to determine what relationships existed between district class, comparative wealth, building age, and population growth, when compared to school managers' perceptions of fiscal capacity for future funding of facilities, as well as physical and instructional qualities of their school districts' facilities.

### Research Questions

1. What is the current status of Nebraska public school facilities? To answer research question one, the following factors were considered: school district building fund levies, bond indebtedness, facility age, safety, capacity, physical condition, internal environment, school type, use of portable facilities, and accommodation for the handicapped.

2. Are there significant relationships between district class, relative district wealth, relative bond indebtedness, building age, county population growth, and how public school superintendents perceived their district's need for facility bond issues, potential for success of a bond issue, delay of facility maintenance, and implementation of technology?

3. Are there significant relationships between relative district wealth, county population growth, and how school superintendents perceived their district's ability to fund facility needs without raising the property tax levy?

### Theoretical Perspective

Current programmatic efforts to implement change call for effective use of systems planning principles. The development of a comprehensive strategic plan for facility improvement requires a needs assessment (Kowalski, 1989). In order that a true picture and understanding of the facility needs for a school district is reflected by a needs assessment, such assessment must be based upon a valid and accurate information system.

To be truly useful, users of an education information system must examine current school information and look beyond the education system itself. Data must be provided on the demographic or background inputs that are likely to affect the condition and performance of students. Data identifying educational resources, both fiscal and non-fiscal, should reveal to education policy makers and the public how education resources are allocated and their relationship to education spending and student achievement. Other information requirements should focus upon school processes that help monitor educational differences and student outcomes and provide for valid measures of programmatic success. Policy makers must have valid, accurate, and comparable information at all these levels to assist in their constant struggle to provide equity and quality in the educational processes.

Planning for change or restructuring of schools will also require changes in the schoolhouse. This belief was confirmed by officials of the Council of Educational Facility Planners International (CEFP). CEFP officials have emphasized that skill requirements of the twenty-first century will not only require a restructuring of schools, but also restructuring of school facilities (Babineau, 1990a). Leaders in CEFP have identified for the

educational planner the areas requiring restructuring and their implication for transformation in educational facilities. These areas include trends in management, roles of the teachers, changes in the curriculum, instructional practices, and evaluation.

In order for decision makers to have adequate information to assess Nebraska school facilities needs by these restructuring trends, a Nebraska school facility information system should exist. Kowalski (1989) stated that initial data collection efforts are often the most difficult, because they require considerable information that many administrators do not feel is essential to the planning process. Many of these same administrators often move to the decision-making phase of planning without an adequate information system in place (Kowalski, 1989).

There is a difference between establishing a Nebraska school facility information system and the collection of baseline school facility demographics. While baseline facility information is valuable as an aid to initial research regarding the Nebraska school facility situation in the early 1990's, this baseline information does not constitute the same information base required to assess facility condition and assist decision makers in determining their plan of action. This baseline information can aid in the determination of the focus of the subsequent information collections regarding Nebraska school facilities.

### Definition of Terms

The terms listed below are those commonly used throughout school facility and infrastructure literature. Common definitions provide for the

consistency required in data reporting to achieve comparable results. For ease of reference they are listed in alphabetical order.

Accessibility for the handicapped. A barrier-free environment where handicapped persons may take advantage of provided services (Lewis et al., 1989).

Asbestos. A soft, fibrous, incombustible material formerly used in many building materials; considered to be a health hazard if not properly contained. A mineral which has been demonstrated to be a carcinogen, linked to lung cancer and other pulmonary diseases (Kowalski, 1989)

Asbestos abatement. The process of reduction of potential prolonged exposure to asbestos in a facility by removal or containment (Kowalski, 1989).

Bond issue. A referendum asking voter approval for the sale of bonds (Kowalski, 1989).

Building fund. An account established in order to justify all applicable expenses associated with new construction activities, including the furnishing of a new building or an addition to an existing structure. The sale of bonds, the sale of property, and tax collections from a sinking fund are the primary source of income for this fund (Nebraska Department of Education, 1985).

Building fund levy rate. A special annual tax levy rate established to accumulate money in an account frequently called a sinking fund or a special building fund. This tax rate is established in advance of building expenditures through a special annual tax for a specified period of years (Nebraska Department of Education, 1985).

Deferred maintenance. The delay of scheduled service or repair, which interrupts the stream of costs and skews the burden of these costs. (Crampton, 1991).

Educational restructuring. A greater emphasis in education on literacy in communication and computation, with an emphasis on self-esteem, understanding, working with others, adapting to change, and uncertainty (Babineau, 1990a).

Enrollment. A head count of students registered to attend a specific school on a specific day (Nebraska Department of Education, 1985).

Permanent attendance sites. A conventional or traditional site-built unit serving long-term space needs which will not be moved (Lewis et al., 1989).

Portable attendance sites. A temporary relocatable unit that can be moved to another site (Lewis et al., 1989).

Property tax. A tax levied against the owner of real or personal property. Real property is not readily movable and includes land, buildings, and improvements. Real property is usually classified as residential, industrial, agricultural, commercial, or vacant. Personal property is movable and consists of tangibles, such as machinery, livestock, automobiles, and crops, or intangibles, such as money, stocks, and bonds (Burrup & Brimley, 1981)

Radon. A heavy radioactive gaseous element of the group of inert gases formed by disintegrating radium; recently identified as a health hazard for some homes and schools (Kowalski, 1989).



School facility adequacy. The degree to which a school building meets the daily needs of curriculum programs, students, and staff, as well as that building's perceived capacity for meeting the needs of a future curriculum, change either in the building's current physical state or in its potential for future modification (Hawkins & Lilley, 1986).

Teaching station. A specific location associated with a learning area designed to provide a support system for instruction (Hawkins & Lilley, 1986).

Technology. An evolving process that enables the development of many products and procedures that will exert an influence on education (Foster, 1988).

### Assumptions

In order to conduct this study as described in the sections concerning the statement of the problem and the research questions, the following assumptions were made.

1. Appraisal of instructional adequacy, physical condition, and financial requirements of school facilities was possible.
2. School managers have valid opinions regarding the adequacy of a school district's educational facilities.
3. Superintendents of schools have knowledge and understanding of instructional, physical, and financial conditions of the school district's current facilities and future facility needs.

4. Central office administrators or building administrators have knowledge and understanding of the instructional and physical conditions of buildings in their system or under their supervision.

5. Responses to the survey instrument were accurate in assessment and sincere in opinion.

### Delimitations and Limitations

Delimitations of the study were:

1. The survey population was restricted to administrators of Class II through Class VI Nebraska school districts.

2. Survey instruments were designed to collect basic information required for the study while requiring a minimum of the respondent's time.

Limitations of the study were:

1. The results are not generalizable to Nebraska Class I school districts.

2. The results of the study contain the inherent weaknesses of survey design.

### Significance of the Study

The significance of this study for Nebraska education decision makers was the provision of the basic demographics of Nebraska school facilities and the analysis of how school managers assess the capability of these facilities to meet the current and future educational needs of their students. An increased

information base regarding the basic capability of Nebraska school district officials to meet the fiscal demand for renovated or new school facilities was also provided by this study.

An information base has been provided by this study that will become a baseline of information for future studies regarding school facility demographics and funding capability. These data will assist in future analysis of the changes in administrators' perceptions of their facilities created by the passage of facility legislation or the passage of time.

## CHAPTER II

### REVIEW OF THE LITERATURE

#### Introduction

Selected literature related to the planning for improvement of school facilities was reviewed. If education decision makers are to have a positive effect upon the education of youth, the mechanisms for improvement planning must be in place. The following topics were examined for inclusion in this chapter: the implications of the transformation of schools to meet changing curriculum, internal environmental concerns, energy, equity of finance, finance methodologies for school facilities, and information needs for planning requirements.

The education of today's and tomorrow's population in the United States is currently a high-priority item for all levels of government. While government leaders have professed to support improvement and change, the truth is that, nationally, there is a short supply of the necessary infrastructure to deliver these new and planned education programs (Westbrook, 1991).

Many current school structures are grossly inadequate, and the financial and equity concerns for replacing these structures are monumental. New demands are being placed upon facilities in order to provide for the special needs of these new programs. Some examples are: the electrical needs for education technology, accessible storage for early childhood education, and additional space in overcrowded schools. To correct this facility problem, billions of construction dollars will be needed. School officials have many financial options to consider before their construction

plans can proceed. The contrast in the goals of school district officials and the implications for school facilities is reviewed in this chapter..

### The Plan for the Future

In 1991, the leaders of the United States announced a plan to define the education system of the country in the year 2000. In this plan, America 2000: An Education Strategy, six broad goals were identified, ranging from school readiness for children to functional literacy of adult Americans (U. S. Department of Education, 1991). These goals are currently supported by state governments, including Nebraska (Nebraska State Department of Education, 1992).

### The National School Situation

At the same time as state and national leaders were looking to the future for education, members of school interest groups were pointing out some very harsh facts about the school facilities in which these new goals were to be reached.

In 1989, Wolves at the Schoolhouse Door was published by the Education Writers Association (Lewis et al., 1989). The generally poor condition of the nation's school facilities was emphasized in this report. Some of these stark facts reported were: 25 percent of the nation's schools were inferior places to learn; 33 percent were only marginally adequate; and the remaining 42 percent were in good condition. Equity concerns, however, were obvious. Major concerns existed about the growing cost of facility maintenance and the increasing backlog of maintenance due to budgetary restrictions. During the 1970s and 1980s, a decline in student enrollments

was mirrored by a decline in facility construction. At the present time, with increasing enrollments created by a more transient population and a new boom of births, the need for school facilities have become paramount. School leaders have estimated that, by 1996, a construction need for new teaching stations will cost \$2.1 billion. Health, safety, and equity concerns, created by the use of asbestos in previous facility construction, containment of radon gas, and handicapped access, have increased the costs of remodeling or modernizing existing facilities. Lewis et al. (1989) noted that future construction work will be hampered by a general lack of facility data and a shortage of planners capable of assisting leaders in school facility redesign.

The report of officials of the Education Writers Association, Wolves at the Schoolhouse Door was supported by the report, Schoolhouse in the Red (American Association of School Administrators, 1991). Authors of this report reinforced the critical issues and focused new light upon the need for increased energy efficiency. Their findings established that many state and local governments did not possess the financial ability to meet facility needs. According to the authors, school energy costs would continue to increase, while energy efficiency projects were not a priority. The lack of facility guidance from federal and state leadership was noted (American Association of School Administrators, 1991).

### Implications for Planners

School facility planners must gather ideas, requirements, and educational philosophies from many areas. Early in the planning stage, the architect will examine the goals of the educators, create a friendly

environment for the users, allow for the building to be an extension of the teacher, provide for a variety of experiences through treatment of space in a flexible manner, and develop a building plan that will facilitate a sense of community within its confines (Christopher, 1990). The education planners examine the calls for greater emphasis on communication and computation skills while working with others and adapting to change (Babineau, 1990a). With the restructuring of education comes the restructuring of the facilities in which these educational activities are to take place. Examples of the need for the restructuring of facilities follow:

1. For personnel directors and managers to implement school based-management, additional space will be required to provide conference areas for staff and team meetings.
2. Using teachers as classroom facilitators will establish a need for larger classrooms to allow for a variety of tutelage.
3. Facility implications in the curriculum area would include problem solving in mathematics, which establishes a need for more flexible seating and grouping of students.
4. In the sciences and social sciences, the need for simulations will establish a need for more computers, interactive video, and other technological innovations.
5. Enrollment of four-year-olds for early childhood education will require specialized classrooms to meet their unique needs.
6. Changes in student evaluation and assessment methodologies will require the accumulation of individual student information.

7. For school personnel to be able to manage information, improved computer management systems will be required.

8. In the guidance area, individual student assessment of matching attitudes toward work and skills for future work will require computer-assisted guidance systems (Babineau, 1990a).

### Facility Needs for Technology

Technology is no longer the dream of educators, but the reality of today. Educational planners' dreams of the future of technology have become, in a matter of years, reality. A major fault is the inability of educational planners to see the broad base of technological advances and quickly apply the technology to education. Babineau (1990b) listed some of the new and emerging technologies to be used for education purposes: networking computers, communications technologies, automated library collections, desk-top publishing, electronic creative arts, robotics, speech synthesis, and long-distance learning. The adoption of these technologies will require that facilities be created or modified to accommodate these changes. Some of these requirements will include increased air-conditioning and ventilation, proper lighting, acoustics, and security (Truett, 1990). Other technically specific items would include easily accessible electric utilities, cabling grids to provide for multiple and flexible cabling options for electronics, television, telephone, and optic-fiber cables. This electronic equipment must be protected by the use of high-quality circuits and circuit breakers as well as back-up power sources (Babineau, 1990b).



Possibly the greatest implication for the introduction of technology into educational programs was illustrated in the document, School Planning and Design (Council of Educational Facility Planners, International, 1991). A model illustrating the "no man's land" which exists between the current technology thoughts of educators and architects was presented in this document. To successfully bring technology into schools, this "no man's land" must be reduced or eliminated.

#### Facility Needs for Early Childhood Education

A need has been clearly established for early childhood education. The percentage of new mothers returning to work has increased from 31 percent in 1977 to 50 percent in 1992; ten percent of these new mothers have come from another country. Seventy-percent of today's school children have working mothers (Council of Educational Facility Planners, International, 1990). Prior to facility decisions, an initial decision must be made by community officials that the public school is the proper site for the early childhood program. Sugarman, (1991) suggested that existing schools might prove to be a valuable resource. Public schools are located in almost every population center and are universally accessible. Social activities tend to be centered in the schools, and school officials have the experience required to manage this type of program (Kagan & Zigler, 1987).

Upon the acceptance of public school operation of the early childhood program by the community, the implications for facility changes must be considered. A theme for these facility requirements might best be summarized by Schweinhart's (1988) statement, "Teachers must be able to

provide children settings in which children can learn actively and construct their own knowledge through personal interrelation" (p. 40). To accommodate this philosophy, children must be able to work in large and small groups, as well as individually, and must be able to reach learning materials. The child's environment should include soft elements, such as carpet, cushions, and grass. Noise pollution should be controlled by sound absorbing materials, and surroundings should be made attractive through the use of color (Nebraska Department of Education, 1989).

Other considerations for facility planners are outlined in the document, Accreditation Criteria and Procedures, published by the National Association for the Education of Young Children (1991). These considerations include appropriate food preparation requirements, washrooms, rest rooms with right-sized appliances, related sanitation necessities, laundry facilities, and adequate exits. Designs should also account for ease of maintenance, minimum use of sharp edges or corners, correct lighting, appropriate handrails, screened windows, covered electrical outlets, and non-toxic construction materials. Playground materials should be safely designed, surrounded by adequate cushion material and placed for proper supervision and security.

### Barrier Free Public School Environments

Public educators are mandated to provide an equitable education to all pupils. Kowalski (1989) pointed to the passage of federal civil rights legislation in the 1960s and 70s as the initial efforts to address individual rights. Equal access to programs, regardless of gender, was mandated by

**Title IX. Programs that were changed to include pupils previously excluded because of sex created a greater demand upon facilities, such as gymnasiums and vocational classrooms.**

**Requirements were established by Section 504 of the Rehabilitation Act, enacted in 1973, that all public buildings be handicapped accessible. PL 101-336, also referred to as the Americans with Disabilities Act (ADA), became effective January 26, 1992. By this act, nondiscrimination was extended to handicapped individuals for employment and accommodations of state and local governmental agencies (Girard, 1992).**

**Title III of the Americans with Disabilities Act requires nondiscrimination of public accommodations for handicapped individuals. A barrier-free school environment is a setting free of architectural and equipment barriers. Architectural and equipment barriers are places or things that would prevent a handicapped person from entering or using the building or school facility (Kowalski, 1989). Wernick (1992) listed examples of some of the modifications that school district officials may face in their efforts to remove barriers. This list included access to all building levels by installing ramps or elevators, making curb cuts, installing flashing alarm lights, installing grab bars in toilet stalls, rearranging toilet partitions, removing high-pile, low density carpeting, and creating designated accessible parking spaces.**

**Wernick (1992) stated that the writers of the Americans with Disabilities Act were aware of the problems of making many of the older structures totally accessible and provided for some alternatives to barrier removal, such as relocating activities to places or areas that are accessible to**

handicapped individuals. Even with the option of relocating certain school programs, many school district officials have been forced to spend maintenance or construction dollars on ADA modifications.

### Energy Management for Public Schools

In a 1977 report, published by the American Association of School Administrators (AASA) (Neill, 1977), the difficult future for controlling cost in the area of energy management was noted. The energy crunch in the United States was initially impacted by the oil embargo of 1973-74. Neill illustrated the impact of energy cost increases for schoolhouses which had been previously constructed with little or no thought for energy conservation. Increased costs to supply future energy needs and remodel schoolhouses to be more energy efficient were estimated to be 20 percent through 1980.

In November of 1991, the AASA (1991) followed with a second report, in which increases in energy costs from 1989 to 90 were confirmed to be 11 percent (AASA, 1991). In this AASA report, School House in the Red, the nation's schools financial obligation for energy costs and deferred maintenance was described as growing by "billions of dollars" each year. The authors of the report also noted that school administrators were getting virtually no facility or energy guidance. In fact, the absence of facility and energy leadership was listed as one of six critical issues in the report.

### Environmental Hazards and Pupil Safety

Environmental hazards and individual safety have become common concerns for both the public and school management. The potential for students and teachers to be exposed to health hazards and safety risks cannot be over emphasized. Health-related issues of friable asbestos, airborne biological and chemical contaminants, radon gas, and lead contamination of drinking water are considered major environmental hazards in many schools. As a result, efforts to make these schoolhouses safe for children will be an expensive task (Lewis et al., 1989).

School districts have been required to protect pupils and teachers from the health risk of long term exposure to asbestos by the Asbestos Hazard Emergency Response Act (AHERA) of 1982. In a 1990 report of the Environmental Protection Agency (EPA), the authors estimated that most of the nation's 107,000 primary and secondary schools contain some form of asbestos. Long-term exposure to asbestos fibers in the air can lead to lung ailments (EPA, 1990). Fortunately, most asbestos is in a contained form and constitutes no danger; however, as asbestos and its containers deteriorate with age, this material becomes "friable" or crumbles. In this situation, AHERA officials have called for removal or containment of the asbestos. Schools are also required to prevent both intentional and accidental exposure to asbestos by developing a special asbestos maintenance plan (EPA, 1990). This plan could call for repairing, sealing or encapsulation, or removing damaged or exposed asbestos materials (EPA, 1988). This mandatory response to the AHERA has diverted district maintenance dollars to inspection and removal of asbestos (McCormick, 1985).

Because of the long hours of confinement in the classroom setting, pollution of air quality by biological contaminants is a major concern for the continued health of school children. Indoor air quality can be compromised by building air-tight facilities to conserve energy. Without a proper mixture of outdoor air or cleaning and recirculation of indoor air, the risk of respiratory health problems may increase (EPA, 1990). In certain classes, the potential for exposure to toxic chemicals in the schoolhouse is a constant concern. Through enrollment in a specific course, pupils may be inadvertently exposed to health and safety risk factors. For example, Hansen (1986) reported the immediate and obvious dangers of the use and exposure of students to toxic chemicals in paints, ceramic glazes, and aerosol sprays in art classes.

In a report of the EPA (1990), the authors reported that radon gas, a naturally occurring radioactive gas, has frequently been found in schools as well as homes. Long-term exposure to radon gas is considered a health risk. Testing schools for radon gas contamination and eliminating such contamination has created additional expenditures for schools (Lewis et al., 1989).

Through the Safe Drinking Water Act (SDWA) of 1974 and its amendment the Lead Contamination Control Act (LCCA) of 1988, the need to inspect for and remove lead contaminants from school drinking water was addressed (EPA, 1989). Lead is a toxic metal that is very dangerous, especially to young children and pregnant women. Lead is frequently used in the solder used to connect drinking water supply lines and especially in the construction of drinking water coolers. The use of lead in any water

collection or distribution system is banned by the Lead Contamination Control Act and requires school district officials to notify the public if their system contains lead (EPA, 1990). Removal of sources of lead contamination and testing continue to siphon off funds from many school district maintenance budgets (Lewis et al., 1989).

### The Equity Issues of Financing Public School Facilities

With the need for improved and expanded school facilities easily recognizable, one would expect that solving the problem would simply require the repair, remodeling, modernizing, or replacement of school facilities. However, major disparities antedate any action to correct the problem. Burrup and Brimley (1981) stated that provisions for the equity of taxation to support schools began as early as the Kalamazoo case in 1874, and the Brown case in 1954. Provisions for equity were carried further by Serrano v. Priest in 1971. The equity problems for the financing of capital outlay for school facilities parallel those of school funding. Acceptance of the state responsibility to equitably fund schools should include equitable funding of capital improvement rather than depending upon a regressive property tax (Burrup & Brimley, 1981).

Burrup, Brimley, and Garfield (1988) presented a summary of the equitability issues as interpreted by court rulings. Among these issues were interpretations that education is considered to be a fundamental interest of the state, and the wealth behind the education of a pupil should be that of the state and not of the parents or the school district. Burrup and others also

indirectly implied that school facility funding should be based upon the same equity factors as those of the general funding of school expenditures.

Even with the current efforts to create more equitable funding of education, financing of school facilities has been a low priority (Thompson, Camp, Horn, & Stewart, 1988). Thompson and others reported that, in 1988, school districts were offered no aid for capital improvement in 22 states. The authors also reported that one major reason for the deficiency of aid for capital improvement was the lack of a research base to establish the relationship between student learning and the facilities in which the education programs were provided. However, in 1992, Winter completed a comprehensive review of court decisions regarding state finance plans, capitol improvement financing, and related research. He reported there was a growing body of research being conducted to confirm a relationship between the schoolhouse environment and student performance (Winter, 1992).

### Current Methods for Financing School Facilities

Variations of the same method for financing school facilities have been given slightly different names by different writers; however, the description of each will clarify the method identified. The methods for school facilities financing can be categorized into federal, state, and local programs

#### Federal Funding of School Facilities

In the 1930's, many schools were built by public works projects. Mandates and control came long with funding from federal and state



organizations. Because education is a state responsibility, very little federal aid is currently available for capital improvement or outlay (CEFPI, 1991). What federal funding has been available usually is allocated to state agencies, where officials then distribute and manage the funding of the programs. These programs are generally special grant programs for vocational and constitutionally determined equity projects (Kowalski, 1989).

### State Funding for School Facilities

In 1988, Thompson identified six categories of state funding. In some states, these categories are utilized separately, while in some, combinations of two or more methods are used. The number of states in which some type of state funding for capital projects is provided may be on the increase. In 1988, Thompson, Camp, Horn, and Stewart reported 22 states provided no funding aid for facilities. In 1989, in the report Wolves at the Schoolhouse Door, Lewis et al. (1989) stated that this number had decreased to 15 states. Thompson and others (1988) used the following six categories to differentiate state funding methodologies:

Full state funding. This method provides that the state supply all of the resources required for all capital improvement projects. The advantage of this method is the availability of a broad tax base to support the projects. Disadvantages are higher than anticipated costs and restriction of local control.

Equalization grants. This method parallels the equalization models used by states for distribution of state aid to education. Based upon ability to pay, school districts with a high need receive a larger proportion of required capital funding than a district with a low need. The advantage of

this system is the ability to place construction funds where they are most needed. The disadvantage is the state's ability to fully fund the program.

Percentage-matching grants. In this scheme, the school district receives a percentage proportion of the capital need from the state. The percentage received is based largely upon the cost and the school's contribution to the project. Providing the incentive to improve facilities is seen as the advantage of this method, while a lack of need equity would be considered the disadvantage.

Flat grants. This is a grant of set dollars based upon a distribution method. Each school would receive a set amount to help reduce the cost of construction. The advantage is that schools at least receive some assistance. The disadvantage is, again, one of equity.

State loans. States that use this method serve as a highly secure low-interest financial institution to loan money to local schools for capital projects. Schools are generally required to repay the entire loan, plus interest. The advantage is the ready source of available low-interest funds, while the disadvantage would be that a poor school district is not only entirely obligated to a project, but to the additional interest.

State building authorities. Some states provide for the existence of these private institutions. These institutions build facilities and then provide them to schools by lease or lease-purchase. The advantage is the access to facilities without the limitations of long-term tax obligations. The disadvantages are the political controversy created by the use of a private agency, which could increase the long-term cost, and the public concern that

potential facility decisions could be made beyond the approval by the democratic process of the public.

### Local Funding for School Facilities

Both Burrup, Brimley, and Garfield (1988) and Kowalski (1989) agreed that the primary concern encountered in most local school districts when considering capital projects is the requirement to finance the construction primarily through the use of the regressive property tax. According to the authors, the property tax, typically based upon some combination of assessed value of personal and real property, is not an equitable base for the construction of school facilities. The taxable wealth base of a school will vary depending on assessment practices; therefore, to compare a school district's "wealth" based upon assessed valuation alone will potentially lead to gross misinterpretations of the tax situation. Because of these potential misinterpretations of assessment, Kowalski (1989) recommended that a more valid measure of "assessed valuation per pupil" be used when comparing the taxable wealth of school districts. One method could be to calculate the quotient of the assessed valuation and divide this amount by the number of students served by a district. In the future, school officials will need to look at a wide variety of methods for funding school facilities. Recently, the idea of a tax-exempt subdivision, such as a foundation, has been introduced in some schools to solicit donations and endowments. These donated and endowed funds typically never reach the amounts required for capital projects in the millions of dollars. Burrup, Brimley, and Garfield (1988), Kowalski (1989), and officials at the Council of Educational Facility Planners, International (1991) identified the

following as the methods available to public schools for locally-funded capital projects:

Pay-as-you-go. This practice is administered by two different methods. In both, a levy is assessed against the assessed valuation to raise a set amount of money for capital projects. First, if the district has the valuation behind the levy to raise significant numbers of dollars on an annual basis, these dollars are placed directly into the general fund for expenditures related to the project. A second method is used when the valuation base does not supply adequate funds on an annual basis, but requires accumulation of these funds over a period of years. The dollars raised by the levy are placed in a building reserve or fund. When these dollars accumulate to the required amount, they are transferred to a fund from which expenditures for capital projects can be used. The advantage to this method is that no debt is incurred in a school district; therefore, no debt service is contracted. The disadvantage is that in poor school districts the burden is placed upon current tax payers for future construction. This magnifies the problem when there is a current facilities need.

Bonding. In this practice, the voting constituents of the school district vote approval to obtain funds for a capital improvement project through the sale of tax-free bonds. Most commonly, general obligation bonds are paid for through the commitment to use local tax funds, over a prescribed number of years, to pay principal, fees, and interest created by the sale of the bonds. This method continues to be the most commonly used method for raising required revenue for capital improvement (CEFPI, 1991). Various types of bonds are used. Each bond type has advantages and

disadvantages. Bond attorneys or agents should be engaged to investigate which type of bond may be appropriate for the project. Types of bonds used for capital projects include callable bonds, coupon bonds, registered bonds, serial bonds, and term bonds. The investment quality of a school district's bonds are assessed by personnel in ratings firms to determine the interest rate. This rating is based upon several factors, such as economics and administration of the district, wealth, current and previous debt service, and state aid payments (CEFPI, 1991). The primary advantage of this method is that funds become immediately available to build facilities. The facilities are paid for while they are in use. The disadvantages include the increased facility expense due to interest, which is intensified for fiscally poor districts that have low bond ratings and pay even higher interest rates, and the fact that negative political climates frequently cause repeated failure of bond issues, even when facility needs are critical.

Shared facilities. With increased use of school facilities and year-round school, this method has gained popularity. Community-use facilities, such as libraries and dining facilities, and physical fitness facilities, such as swimming pools and gymnasiums, are frequently built by combining the financial capacity of two or more mutually-interested public agencies, such as schools and community park and recreation authorities. The advantage is the increased financial base and potential for public support. The disadvantages include the potential of problems because of the duality of management and maintenance.

Leasing and lease-purchase. As the demand for school facilities arise, a facility at a predetermined cost can be provided by private interests.

The lease and lease-purchase requires that the school district pay this set fee for a contracted period of time for the ongoing use of a permanent or temporary facility. In the case of the lease-purchase, the long-term contract is written so that, after a given period of time, the ownership of the property is transferred to the school. The advantages of the lease and lease-purchase methods for schools is that facilities can be made readily available without the process of bonding. In some cases, lease-purchase is a more cost-effective alternative than bonding. The disadvantages are that the financial obligation to for-profit agencies could lead to inflated facilities costs and the negative perception by the voting citizens of the community that their wishes are circumvented (Thompson, Camp, Horn, & Stewart, 1988).

### Summary

Implications for restructuring education for the year 2000 are manifold. The impact of these changes upon public school facilities is no less complex. The planning process for school facility construction and maintenance should be based upon a complete and accurate appraisal of current school facilities and needs. In areas such as equal accessibility for handicapped, safety, early childhood education, and technology, facility planners must constantly work with educators and architects to assure that school facilities can meet these changes in instruction. Likewise, state and school leadership must strive to meet these challenges by providing adequate funding for facilities and programs. Various means for financing facilities should be examined to determine which methods best meet the educational needs for the students of each state and each local school district.

## CHAPTER III

### METHODOLOGY

#### Introduction

The requirement for a facilities information base to assist decision makers was identified by a review of literature on facility needs and planning. This information base should be rich in detail and comprehensive in scope. The purpose for conducting this study was to establish an initial Nebraska public school facilities inventory for Nebraska decision makers. The information collected was analyzed to illustrate the current status of Nebraska school facilities and the opinions of school district administrators regarding the educational and structural adequacy of their facilities. The research questions were designed to investigate the relationship that existed between school district wealth, bond debt, building age, school district population growth, and the opinions of school superintendents regarding their district's ability to keep pace with current educational initiatives and facility construction financing.

#### Population

The 1991-92 Nebraska Class II, III, IV, V, and VI school superintendents and building principals comprised the population for this study. During the 1991-92 school year, there were 299 school districts in the five classifications studied. Class I school districts were excluded from the study because of their inconsistent employment of an on-site

administrator. The classification of Nebraska public school districts were determined and defined by State Statute §79-102 R.R.S. as follows:

Class I. Class I shall include any school district that maintains only elementary grades under the direction of a single school board.

Class II. Class II shall include any school district embracing territory having a population of one thousand inhabitants or less that maintains both elementary and high school grades under the direction of a single school board.

Class III. Class III shall include any school district embracing territory having a population of more than one thousand and less than one hundred thousand inhabitants that maintains both elementary and high school grades under the direction of a single board of education.

Class IV. Class IV shall include any school district embracing territory having a population of one hundred thousand or more and less than two hundred thousand inhabitants that maintains both elementary and high school grades under the direction of a single board of education.

Class V. Class V shall include any school district embracing territory having a population of two hundred thousand or more that maintains both elementary and high school grades under the direction of a single board of education.

Class VI. Class VI shall include any school district in the state of Nebraska that maintains only a high school.

There were 777 Class II through VI public school districts in Nebraska during the 1991-92 school year. The numeric distribution of these schools among the six classifications is illustrated in Table 1.



**Table 1**  
**Number of 1991-92 Nebraska Public School Districts by Class**

<b>Class</b>	<b>Number</b>
<b>Class I</b>	<b>478</b>
<b>Class II</b>	<b>51</b>
<b>Class III</b>	<b>225</b>
<b>Class IV</b>	<b>1*</b>
<b>Class V</b>	<b>1*</b>
<b>Class VI</b>	<b>21</b>
<b>Total</b>	<b>777</b>

\*At the time of the study the Lincoln Public Schools and the Omaha Public Schools were the only Nebraska Class IV and Class V school districts, respectively.

### Research Design

The research design for this study was survey research. A primary goal of the study was to collect a representative picture of the condition of school facilities throughout the state. A survey was developed and used to collect both facility demographics and the opinions of school administrators concerning their districts' attendance center facilities.

Survey research design was chosen because this design is well-suited for measuring attitudes, opinions, and values and for gathering demographic information. When using the survey design the researcher can collect large amounts of data inexpensively which can be easily replicated by other researchers (Haller, 1979).

### Instrumentation

Two survey questionnaires were created to collect information from both central school district and attendance center administrators. Questions on the questionnaires were posed to elicit school facility demographic information and school management opinions regarding the administrators' respective facilities. Question responses were designed to obtain single numeric and yes or no responses. In addition, the attendance center administrator instrument contained questions requesting a rating of facility adequacy and condition.

Instruments were juried by two members of the faculty of the University of Nebraska -Lincoln Graduate College and administrators from four public school districts. Suggestions regarding definition, format, and

additional questions were received from the jury. These suggestions were incorporated into the final questionnaires (see Appendix A).

#### District Survey Instrument Description

This instrument was designed to collect specific fiscal, demographic, and opinion information from the district level or central administration of the responding district. The instrument included a total of 15 questions. Information was requested concerning eight specific identifiers or values and for seven yes or no responses. The respondent was asked to identify the school district by name and give the county-district number and superintendent's name. Fiscal information requested was limited to the 1990-91 building fund levy rate and the current bond indebtedness. The opinions of the respondents were solicited regarding the anticipation of a building bond issue, delayed facility maintenance, adaptability of the facilities to technology, handicapped accessibility, fiscal capability to meet facility needs, and the number of permanent and portable attendance sites. Appendix A contains a copy of the district survey instrument.

#### Building Survey Instrument Description

This instrument was designed to collect specific demographic and opinion information from the building level or central administrator who was knowledgeable about the specific attendance center. The instrument included a total of 50 questions. Information was requested concerning for four specific facility identifiers, eight specific values, 20 indicators of grades of instruction offered or facility construction date ranges, nine ratings of facility condition, and six yes or no responses. The respondents were

requested to identify the school district name, the county-district number and the school facility name and address. In addition, they were asked for information concerning grades of instruction offered, date range of original construction, construction dates of additions, number of teaching stations, site size, and facility enrollment. Opinions of the respondents were solicited regarding the facility's pupil capacity; the adequacy of the building concerning the current instructional program, interior and exterior physical condition, air conditioning and comfort of the classrooms, accommodation for technology, handicapped accessibility, freedom from safety hazards; and the inhibition of educational programs. Appendix A contains a copy of the building survey instrument.

### Data Collection

With assistance from the Nebraska Council of School Administrators, the questionnaires were mailed to the 299 Nebraska Class II, III, IV, V, and VI public school districts in October, 1991. An initial response was made by 245 school district administrators. Beginning in March of 1992, members of the Senior Fellows, a group of retired administrators, made telephone follow-up calls to the superintendents of non-respondent districts. This follow-up resulted in the completion of 45 additional questionnaires. In August and September of 1992, a third and final follow-up was completed. This final effort brought the total response to 100 percent of the 299 potential respondents.

Data analysis was based upon the survey responses from Nebraska school districts. The numbers of schools by class are illustrated in Table 2.

Table 2

Survey Responses from Schools by Class

Class	Number of School Districts	Central Office Respondent(s)	Building Respondents
II	51	51	69
III	225	225	629
IV	1	1	46
V	1	1	63
VI	21	21	21
Total	299	299	828

Responses to all completed questionnaires were analyzed. Items that were answered on partially completed questionnaires were also analyzed. Unsolicited responses were summarized, but not analyzed (see Appendix B).

Data from the Nebraska Department of Education used for the School District Annual Financial Report concerning the building fund levy, bond debt, and pupil average daily membership were used in the district analysis rather than the same information collected on the district survey instrument. This substitution was made because of the inconsistency discovered in the reporting of the data on the district survey instrument.

### Data Analysis

A descriptive presentation of the school district and building demographic information was made using frequency tables and cross-tabulations. Data were categorized by district class, quartile of relative wealth, county census population change category, and period of original facility construction. The data were further categorized into building classifications by instructional grade range. The variables were analyzed using the computer program Statistical Analysis Support(c) by SAS Institute Inc., of Cary, North Carolina, version 6.07 (SAS). Cross-tabulations were used to demonstrate frequencies and, where applicable, central tendency.

The data collected for this study were population data. The use of statistical tests to determine significance is meaningless when population data are analyzed. If a difference appears in the results, a true difference is

represented, because the entire population has been studied (Borg & Gall, 1989).

In the initial analysis of the data, no presumptions were made about the scores or the shape of the population. The objective of this study was to describe and establish the relationships that existed among variables and categories of variables. The nonparametric statistic chi-square was selected for the initial analysis. Chi-square was calculated to assist in the determination of the proportional relationship among the variable categories (Borg & Gall, 1989). Chi-square is sensitive to sample size. With small samples, the chi-square test is not very powerful, and with large samples the chi-square test is overly powerful (Freed, Ryan, & Hess, 1991). Because of the large size of the population studied in this project, a contingency coefficient for each chi-square test was also calculated and reported. The contingency coefficient is used to measure the degree of relationship established in the chi-square test (Borg & Gall, 1989). Measures of central tendency, including mean, maximum, and median, were used when required to clarify the data.

In order to study the shape of these data, tests for raw, proportional, and cumulative frequencies by variable class were included. These variable classes included class of district, quartile of relative wealth, category of county census population growth, period of original facility construction, and, for individual buildings, the category of building by instructional grade ranges. Stratification of the variables was completed when required to clarify and provide categorization of the data. Graphs were used as visual representations to clarify the relationships or frequencies.

The listing of the summarized district and building data files are included in Appendix C.