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Andrews University

School of Graduate Studies

A MODEL FOR THE DEVELOPMENT OF EDUCATIONAL SPECIFICATIONS FOR SMALL SCHOOLS

A Dissertation

Presented in Partial Fulfillment

of the Requirements for the Degree

Doctor of Education

by

Raymond K. Wilkinson

June 1978

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A MODEL FOR THE DEVELOPMENT OF EDUCATIONAL SPECIFICATIONS FOR SMALL SCHOOLS

A dissertation presented

in partial fulfillment of the requirements

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by

Raymond K. Wilkinson

APPROVAL BY THE COMMITTEE:

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ABSTRACT

A MODEL FOR THE DEVELOPMENT OF
EDUCATIONAL SPECIFICATIONS
FOR SMALL SCHOOLS

by

Raymond K. Wilkinson

Chairperson: Edward A. Streeter

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ABSTRACT OF GRADUATE STUDENT RESEARCH

Dissertation

Andrews University

Department of Education

Title: A MODEL FOR THE DEVELOPMENT OF EDUCATIONAL SPECIFICATIONS FOR SMALL SCHOOLS

Name of researcher: Raymond K. Wilkinson

Name and title of faculty adviser: Edward A. Streeter, Ed.D.

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Problem

The process of carefully planning school facilities to accommodate and support a particular educational program is but a recent addition to educational theory and practice. In fact, the use of educational specifications, in which educators describe how a school will operate, and thus guide the architects in their process of design, has developed within the same general period of time during which schools have grown in size and complexity (Callahan, 1962; Roaden, 1963). As a result, the process of planning has largely been related to big schools, and the distinctive needs of small schools have been neglected. The purpose of this study was to prepare a planning model which could be followed as a guide by a community

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preparing educational specifications for a small school in Michigan.

Method

The study utilized the descriptive and developmental methods. Literature was reviewed to gather concepts related to educational specifications that could apply to the planning of small schools, and to the programs and facilities of small schools. A survey was made of small schools in Michigan, and principals of small schools were asked to evaluate various features of the facilities available to small schools. Ideas were gathered from personal contact with educators particularly concerned with facility planning, and/or small schools. On the basis of the ideas and information gathered, a planning model was developed, setting out in sequential steps the process by which a community could develop educational specifications for a small school. The model was sent to a jury for validation.

Conclusions

Major conclusions drawn as a result of information and experience gained during the course of the study were that:

1. Small schools are being designed and built, and there is reason to believe they will continue to provide a needed service in the future.
2. The planning process for a small school is similar to, yet distinct from the planning of larger schools in that particular problems must be met, and distinctive answers sought for them.
3. Restricted funds for the planning process, and the limited availability of professional help are two problems a community

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planning a small school will possibly face.

4. Small schools have a particular potential for individualized and small group activities. To realize that potential, suitable facilities must be provided.
5. Much of the furniture and equipment provided for a small school should be mobile, so that the flexibility needed in a small school can be achieved.
6. The provision of semi-specialized centers in a small school can largely obviate the disadvantage small schools have in not being able to provide the specialized instruction areas found in larger schools.
7. Small schools have the potential to benefit from research and technology related to home construction, particularly in regard to energy conservation and supplementary sources of energy.
8. Small schools are likely to meet increased needs in the future, requiring extensions to the initial building. It is particularly important, then, that the initial building be adaptable.
9. Schools with more than three full-time teachers are likely to add more specialized areas, such as an instructional media center, for shared use. In this way the function of some of the centers found in smaller schools is centralized.
10. It is possible to outline a sequence of steps which a community can follow in preparing educational specifications for a small school.

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Recommendations

Based upon the findings of this study, the following recommendations are presented for consideration:

1. Similar surveys of small schools should be made in areas other than Michigan, so that regional differences and needs can be analyzed and better understocd.
2. The model developed in this study should be field tested by communities planning small schools, and revised in the light of experience.
3. Short training courses should be provided to prepare educators to serve as project administrators in the developing of educational specifications for small schools.
4. Particular pre-service and inservice programs should be prepared to help teachers of small schools learn how to care for, and use, the facilities available to them in a small school setting.

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CHAPTER I

INTRODUCTION

Background

The earliest and most typical educational institution in the pioneer days of the United States was the one-room, community school. As new settlements spread across the vast expanse of the new continent, these small multi-grade schools proliferated, providing the children and youth of the new world with a basic but highly prized education.

In the first half of the nineteenth century the so-called Lancasterian schools, in which the use of monitors made it possible for one teacher to direct the learning of an increased enrollment, helped to introduce the idea of larger schools (Cubberly, 1925). The construction of the first graded school in Boston in 1847 set a new pattern for education in the growing urban centers, and when the business oriented concepts of cost effectiveness and efficiency passed from the new industrialization of the twentieth century to the growing body of professional educators, the effect was soon apparent: larger and still larger schools were built, and many small schools were either eliminated completely, or amalgamated with others (Callahan, 1962).

However, for some time the majority of schools were still very small. In 1918 there were over 196,000 one-teacher schools, and

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as late as 1930 of 238,000 public elementary schools 149,000 (nearly 63 percent) were one-teacher schools. By 1972, after the intense program of consolidation which followed the second world war, of the 64,945 public elementary schools, only 1,475 (less than 3 percent) were one-teacher schools (Digest of Educational Statistics, 1974; Gaumnitz, 1959). Research appeared to support the concept of larger school districts and larger schools--particularly with regard to cost effectiveness. As a result considerable effort was expended in combining small school districts, closing small schools, and developing ever larger school units (Mullins, 1973).

But not all educators accepted the notion that bigger was better. A growing corps of writers began to extol the virtues of small schools, presenting evidence to show that such schools could be both effective and cost efficient (Featherstone, 1977; Holt, 1977; Loustaunau, 1975; Ravitch, 1977; Schumacher, 1973; Sher and Tompkins, 1976).

It was found that important social needs were being met by small schools. First, there were isolated communities where children had either to attend a small school in their home community or face the undesirable alternative of being forced to leave home to attend school. Second, there were groups within the larger population areas that, like some church groups, wished to operate separate schools for ideological reasons, but whose scattered and limited membership prescribed that even in some urban areas many of the schools operated would be very small. Third, there were people who believed that small schools offered particular educational advantages, and so kept the schools they supported small by choice.

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There was reason to believe, then, that small elementary and junior secondary schools would continue to provide for the educational needs of a small but important segment of the population. Helping communities that wished to plan and develop optimum facilities for small schools appeared, for this reason, to be a worthwhile objective.

Central to the process of planning educational facilities is the preparation of educational specifications. These provide a graphic vehicle of communication between the educators and future users of a desired facility on the one hand, and the architect--who in his turn seeks to design appropriate spaces to meet the educational needs of the community.

The process of facility planning has been studied in a variety of ways, including actual case studies as well as the use of a systems approach, computer programming, and the creation of models. Such studies, however, focussed almost exclusively on the planning of large schools. This study centered on the preparation of educational specifications for small schools.

Statement of the Problem

The development of educational specifications is a vital factor in the process of planning school facilities. Educational leaders are charged with the responsibility of developing the plans for new schools, but in a small community there is less likelihood that available leaders will understand either the function or the process of crucial pre-design planning, and the preparation of educational specifications. There was a need, then, for a set of guidelines, and planning model, specifically developed to help isolated communities

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or scattered constituencies wishing to prepare educational specifications for small schools.

Purpose of the Study

The purpose of the study was to develop a planning model, or flow chart, complete with explanatory notes, which could be used as a guide by communities preparing educational specifications for small schools.

Related purposes, providing background for the model being developed were:

1. To show the need for, and purpose of, educational specifications in the process of designing effective schools, including small schools, and to suggest the content of educational specifications for small schools
2. To outline current trends and alternatives in the facilities provided for small schools. Trends in curriculum would also be outlined to the extent that they influenced facility needs.

Basic Assumptions

Basic assumptions for this study were:

1. Change in society was continuous, and this was reflected in educational goals and programs.
2. Small schools provided a needed educational service, and were viable educational units.
3. Physical facilities affected the educational programs which could be offered in schools.
4. Facility and curriculum trends and alternatives for small schools could be ascertained by surveying literature and research, and by

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gathering data from teachers serving in small schools.

5. Developments in building and educational technology affected the design of school facilities and school programs.
6. The effective designing of a school plant was a complex process which called for the cooperative effort of educators, architects, and the community to be served by the new school.
7. The development of a model for the preparation of educational specifications for small schools could provide communities involved in the planning of such schools with a useful guide to follow.

Limits and Delimitations

In addition to the pervasive limitations imposed by considerations of time and finance, the following delimitations applied:

1. The study was limited to small schools as defined for this study; that was, elementary schools with an enrollment of no more than 120, as well as elementary schools with a capping of junior secondary grades and an enrollment of no more than 150.
2. The study, and the model developed, applied only to regular schools, and neither included nor applied to special education or vocational schools.
3. The gathering of data from teachers serving in small schools was limited to the State of Michigan.
4. The model, and its accompanying notes, reflected state school facility requirements which applied in Michigan, and data gathered from Michigan schools. As a result the model developed could have direct application only in Michigan--although it

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was hoped that the basic concepts could have a much wider application and usefulness.

5. The major objective of this study was the development of a planning model to guide in the preparation of educational specifications for small schools, not to recommend a particular educational program. No attempt was made to evaluate the educational effectiveness of any of the educational programs presented as options, or to endorse any of the alternatives and trends in facilities and curriculum that were included in the study.

Definition of Terms

Adaptability: The quality of a building which allows for future change of a high magnitude. Such change possibly requires extension or basic changes to the structure and services of the original building.

Architectural Specifications: (Building Specifications) A technical supplement to, and explanation of, architectural drawings. Such specifications typically deal with the conditions of construction, the bidding and awarding of contracts, and technical requirements to be met by the building.

Carrel: (a) Activity, or "wet" carrel: A study table, usually with high sides, designed to create an element of privacy for study, and containing built-in features such as a head-set, a screen for use with video aids, or tools for particular activities (such as a microscope for use in science). Due to their wiring, activity carrels are not mobile. (b) Study, or "dry" carrel: A semi-isolated individual table, or booth, at which a pupil can study.

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Charrette: A planning session where particular people gather for a specific purpose. An example would be the meeting of members of a community to discuss educational aspirations for a new school, and prepare a statement of educational goals.

Compactness: The quality of a building whereby the perimeter is kept small in relation to the total area enclosed. A circular building is the most compact, and the more right angles in the perimeter, the less compact the building becomes.

Curriculum: (a) Latent: What is taught unintentionally, in contrast to what is set out in the school's written curriculum and is taught intentionally. This aspect of the curriculum is currently attracting increased study. (b) Overt: The facts, concepts, skills, and values that teachers and schools state openly that they are teaching.

Delphi Model: A people oriented method of obtaining a convergence of opinions through a process of rounds. The procedure involves a repeated listing of opinions, their evaluation, and a movement toward a final concensus. This process is generally successful in achieving a group supported statement of opinions or objectives.

Educational Specifications: Organized narrative descriptions of desired educational programs and related space requirements, for a proposed facility. They are not detailed technical architectural or building specifications that an architect may prepare for a building contractor, nor yet precise statements describing an instructional program. They are a communication between an educator and an architect in which the educator briefly outlines the educational program

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for a new facility, including space needs and their relationships. The architect in turn translates the educational specifications into architectural drawings. Educational specifications are thus a basic vehicle of communication for effective educational facility planning.

Educational Technology: The range of media available to the teacher, including such traditional aids as chalkboards, work-books, and overhead projectors, and the newer electronic innovations such as video-tape recorders, and computers.

Environment: The sum of all the factors that combine to create a teaching/learning situation. The school's environment can be divided into: (a) physical environment, which includes the thermal, acoustic, lighting, and aesthetic aspects of the school building, and (b) psychological environment, which includes everything outside of the individual to which the individual responds and interacts, either consciously or unconsciously.

Equipment and Furniture: All the facilities and educational tools of a material nature either attached to, or contained within a building, but not an essential part of the structure itself. Instructional materials such as books are excluded.

Flexibility: The quality of a building which allows variation in the use made of the space provided, without adapting the building itself. A flexible building is one in which day-to-day changes may be made in activities, time-tabling and grouping, possibly with the use of movable equipment and furniture. The more readily such changes can be made, the more flexible the facility is.

Flexible Grouping: The use of a variety of both organized and spontaneous groups of pupils as activity or instructional groups, for

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either short or longer periods of time.

Individualization: An educational approach in which an attempt is made to meet the specific needs of each pupil, by providing varied educational experiences appropriate to individual needs and potential.

Instructional Program: The planned procedures, courses, and instructional activities of a school, or department of a school.

Model: A symbolic representation of the various aspects of a complex process or situation, showing their interrelationships. In this study the model developed will be a flow chart for organizing the various tasks involved in the development of educational specifications for a small school.

Multiple Grades: The type of program in which a range of age groups, divided into grades, is cared for by one teacher. A clear example is a one-teacher school, in which one teacher cares for up to six grades.

Nongradedness: A term used to cover a variety of educational programs favoring individualization, and making a deliberate deviation from the conventional graded approach to school organization.

Open Education: A spectrum of educational programs (based on an educational concept initially defined in Great Britain) in which the student has a degree of choice regarding the educational activity he or she will be involved in at a particular time. Openness is thus a relative quality, related to a school's social climate and educational program, and not to a particular physical characteristic of a school building (such as open space).

Open Space or Open Environment: A physical space characterized by the reduction, or even the complete elimination of internal floor

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to ceiling walls. Equipment and furniture may be used to identify more specific spaces within the total enclosed area.

Orientation or Space Orientation: The proximity, or relationship of spaces one to another.

Programmed Instruction: An educational method in which a student is presented material to be learned in a carefully controlled sequence of instruction and testing, and receives immediate feedback (awareness of results). Programmed material may be presented in book form, or by machine.

Small School: A typical definition has been a school which supports no more than one classroom per grade in an elementary school (Sher and Tompkins, 1976), and fewer than one hundred in the graduating class for a high school (James Bryant Conant's definition). In this study, however, a small school will be an elementary school with no more than 120 pupils in K-6, or no more than 150 pupils when there is a capping of junior secondary grades. Such small enrollments are almost certain to involve the use of multiple grades and the dividing of instructional areas into specialized centers rather than the provision of specialized classrooms.

Space Relationships: The manner in which a space, or grouping of spaces, is oriented to other spaces or groupings.

Team Teaching: A trend away from the conventional organization in which a teacher cares exclusively for a class or a subject. Instead, a 'team' of teachers shares responsibility, each member contributing according to his or her particular potential.

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Review of Related Literature

Although the concept of educational specifications emerged in the 1920's (Roaden, 1963), there were very few references to them in books and journals published prior to World War II. Since that time, however, an increasing emphasis has been given to the need for carefully written educational specifications as an essential element in the planning of school facilities.

In 1955, Wilson wrote an unpublished doctoral dissertation at the University of Michigan, outlining the evolution, preparation and content of educational specifications. Since that time many dissertations have been written on a wide variety of topics related to school facility planning and educational specifications. In this study over one hundred were found which related in some way to the preparation of specifications, the physical facilities of schools, or the educational programs of small schools.

The ERIC microfische file was found to contain many otherwise unavailable items dealing with either educational specifications or the educational programs of small schools. Included in the ERIC file were also microfische of publications from the education departments of several states, setting out guidelines for the planning of schools within that state. There were also microfische copies of the educational specifications prepared for some schools. Very little of this material related specifically to small schools, but did provide ideas that could be adapted, and applied to the needs of small schools.

Some school architects, like Perkins (1962), Shrivastava (1974), and Vickery (1972), have given useful insights into school planning from the architect's point of view. In some cases architects and

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educators have collaborated in discussing the planning of schools, as in the case of Leggett, Brubaker, Cohodes and Shapiro (1977) who prepared a useful collection of ideas on planning flexible learning space.

Although most of the material mentioned related primarily to schools in the United States of America, Pearson (1972, 1975) provided a fresh perspective concerning school facilities in Great Britain, and a well prepared report on a conference of school planners sponsored by the Organization for Economic Cooperation and Development, Paris. Other relevant material was also published by the Unesco office for South East Asia in Bangkok.

There were many journal articles dealing with innovations and trends in elementary school curriculum and educational technology. A few innovations related particularly to small schools, but most were more general in application, outlining programs which would need to be adapted for small schools. The literature not only revealed a need for small schools, but presented a mounting volume of support for particular qualities related to smallness. Writers claimed that there were particular strengths and potential advantages inherent in small schools (Featherstone, 1977; Holt, 1977; Loustaunau, 1975; North Central Association, 1974; Ravitch, 1977; Schumacher, 1973; Sher and Tompkins, 1976).

In summary, the literature provided clear support for the preparation of educational specifications as a vital element in school planning, and considerable agreement as to the desirable content of the written document an architect should receive. Guidelines for those preparing educational specifications, however, related primarily

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to the planning of large schools, and required adaptation to generate guidelines that applied more specifically to the needs of a community planning a small school.

Never before had there been such a variety of innovative ideas and educational technology awaiting the consideration of school planners. Groups planning small schools needed to be aware of the options available as they designed an educational program for their particular school. Planners also needed to understand the implications their decisions regarding an educational program would have on the facilities needed in their school. Because of the pace of social and technological change there was need, too, for planning groups to be mindful of the need for flexibility and the possibility of future change to be built into the facilities they planned.

Related Studies

A number of studies which provided the basis for doctoral dissertations were clearly related to the present study. Seven of these are summarized in this section.

Yulo's (1962) study sought to bring to the attention of superintendents, teachers, boards of education and others interested in planning the facilities of a small K-12 school, a concept called Small School Design. The process Yulo recommended was based on the experience of a federation of twenty-seven schools in the Catskill region of New York State, known as the Catskill Area Project in Small School Design.

The primary objective of the project was to help provide facilities able to adequately house a school program incorporating

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such organizational patterns and learning materials as: multiple classes, supervised correspondence study, filmed courses, telephone teaching, teacher aides, television, flexible scheduling, programmed instruction, teaching machines, magnetic tape recorders and players, and other types of educational technology.

Particular recommendations made for the design of small school plants were:

1. Facilities should serve a basic small group of one to six pupils, and provide for the coordination of such groups.
2. K-12 should be provided for in one building which facilitated learning at all levels, including adult education.
3. K-12 should have large open areas in which space dividers could provide flexible learning areas.
4. Facilities should provide for mobility of most equipment, plenty of storage space, less space for halls and walls, and no stairways.
5. Space, furniture, and equipment should be planned and designed to the end that the facility functioned more like a home, which informally served small groups, than a factory, which was specialized and highly organized for mass action.

Roaden (1963) sought to identify the essential elements of educational specifications for school plant facilities. After carefully examining the literature, analyzing twenty-five sets of written educational specifications, and submitting a tentative list to a panel of experts, Roaden identified seventeen elements as being essential to educational specifications. These were:

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(a) the problem
(b) statement of educational philosophy and objectives
(c) type of school and organization
(d) general enrollment policies
(e) description of those to be served
(f) community use
(g) general trends
(h) general environment
(i) auxiliary services
(j) general area relationships
(k) desired educational outcomes
(l) discernible trends
(m) activities
(n) specific enrollments
(o) space needs
(p) furniture and equipment
(q) special requirements (pp. 118-19)

Other elements not considered essential, but at least desirable were:

(a) the planning process
(b) traffic
(c) summary of space requirements
(d) limitations and requirements under which the architect must work
(e) description of site
(f) storage requirements
(g) desired space relationships within each department (p. 120)

Eleven schools provided the data for Day's (1970) study of the basic concepts related to school facility planning. Findings related to the present study were:

1. Initial costs of buildings were reduced by compactness and the use of repetitive design elements.
2. Educational leaders claimed a compact building was more easily supervised and maintained.
3. Architects believed a multi-zone system was the best system for thermal control in a compact building.
4. Open teaching spaces were favored by most occupants of the selected schools.
5. Visual dividers (using furniture and equipment such as chalk-

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boards, tackboards, and storage cabinets) provided a greater degree of flexibility than did operable (folding) walls.

6. The common audio-visual aids being utilized, in order of preference, were the overhead projector, record players, film-strip and sixteen millimeter projectors.
7. A need was expressed for more films, records, tapes, etc., commonly referred to as educational software.
8. Air conditioning and carpeting were considered the two most important features in the selected schools. School administrators indicated that carpeting was cheaper to maintain than were resilient floors.
9. Furniture and equipment was considered the most flexible feature of the selected schools.
10. A high degree of color coordination was evident in furniture, carpeting and walls.

Using a review of literature, and structured interviews with architects experienced in using educational specifications, Benson (1973) studied the use of educational specifications by architects in the design process for conventional (where the architect designs a building to meet specified educational requirements), systems (utilizing prefabricated subsystems manufactured in a factory), and design-build (where the facility was designed and constructed by a consortium of architects and builders) methods of construction.

Conclusions Benson arrived at were that:

1. Educational specifications were considered an essential part of the planning process for new educational facilities.
2. Architects preferred to have educators develop the written

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document outlining the educational program and requirements for a facility.

3. Educational specifications, and continual conferences of architects and clients permitted maximum input from educators toward the design of a school.
4. The design process involved bubble diagrams, sketches, preliminary drawings, and finally working drawings for the project.
5. The conventional method of management was best known by educators, architects, and contractors, and assured the client of receiving the best building for fulfilling the stated educational needs of a community.

Based on the results of a two-week facility planning charrette, Keyes (1974) study developed a handbook outlining steps designed to build trust between school system personnel and a community, during the planning of educational facilities. Keyes suggested that the development and maintenance of mutual trust provided the essential foundation for each step.

The carefully encouraged participation of community representatives and educators in the planning process, based on mutual trust, was presented as the most effective means to plan an educational facility that would satisfy the values and goals set by the community.

Blue (1975) studied, largely through a historical approach, the way in which the one-room school environment accommodated personalized learning. He used a wide variety of documents, 283 interviews with 179 individuals, and personal observation and participation in two currently existing one-room schools.

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His major findings and conclusions were:

1. Rural one-room schools were nearly always isolated, serving communities where the relationships between people were highly personal, and people tended to hold common beliefs and values.
2. Because of the age range housed in the school, learning had to span introductory and more advanced activities. Students did not experience learning on the basis of age, but could progress according to ambition, talent, and personal circumstances.
3. Because of administrative expediency and control factors, grades were multi-aged, and students progressed from level to level rather than from grade to grade. In some cases students progressed through enough levels to be double or triple promoted.
4. Teachers compensated for the learning differences of students by crossing grade levels for various subjects. Grade designations were different from the age grading in contemporary schools. Students were not expected to function because of their ages, but according to what they knew, and needed to learn next.
5. The abilities to follow and lead were emphasized and facilitated in both learning and play activities. Students led, followed, provided help, sought help, or worked and played by themselves.
6. Instruction and learning were not attempts to simulate life, or to prepare for adult living--they <u>were</u> life. For book learning to be valued, some utility had to be seen. The importance of reading or mathematics had to be demonstrated as being vital to daily living in order for it to be valued.

There were three areas of focus to the investigation Clayton (1976) carried out. He sought to discover:

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1. To what extent, if any, the design of elementary school buildings facilitated or hindered the adoption of innovative instructional practices.
2. The nature of changes necessary, if any, in the physical plant to accommodate innovative instructional practices.
3. The contributions made by various people involved in the planning of schools.

Data were collected by means of a questionnaire which was sent to principals of elementary schools constructed between 1960 and 1970 in the State of Connecticut.

Major findings relevant to the present study were:

1. The majority of new elementary schools were of one story construction, utilized the wing design, and were designed to house over five hundred students.
2. Wing design schools required more physical changes than other designs to accommodate new instructional practices.
3. Physical features most frequently designed into new schools were areas for large and small group instruction, and provision to convert rooms or areas to various sizes.
4. The majority of principals were dissatisfied with the new schools due to a lack of flexibility of the buildings.
5. In the planning of schools the superintendent, school board, and lay members of the community, in rank order, made contributions to the plan. The contributions made by principals and teachers were considered of less importance than non-professional contributions made to the plan.

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Procedures

The purpose of this study was the development of a model to provide guidance to communities wishing to prepare educational specifications for small schools. The development and validation of the model involved:

1. A survey of literature and research, to which there were two aspects. The first involved a study of the need for, and the purpose of, educational specifications. This section of the survey provided the basis for suggestions regarding the content of educational specifications for small schools. The second aspect of the survey of literature involved a study of current curriculum trends in small schools as they affected facility needs, and trends in the facilities being used in small schools. This section of the survey provided a basis for the listing of options that needed to be considered by groups planning facilities for small schools.
2. The utilization of a questionnaire originally designed by the National Study of Secondary School Evaluation (1969) and revised by Dolence (1970). The instrument, which surveyed the availability and use made of various facility alternatives (such as carpeting and movable furniture) was further revised and related to elementary and middle school grades. The questionnaire was sent to all small schools (within the limits of the definition on page ten) listed in the Michigan Education Directory and Buyer's Guide 1977-78, and the Michigan section of the Lake Union Conference of Seventh-day Adventist 1977-78 Directory.

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Of particular interest were schools built within the past ten years. Data gathered in the survey were displayed in tabular form, showing the percentages of the schools surveyed that had particular physical features, and the evaluation of the usefulness of the features by the principals of the schools.

3. The gathering of data from the schools, and the literature reviewed, which were then used to designate the major options in program, and the related facility needs, available to small schools. These alternatives were related to decisions a planning committee would have to make in the preparation of educational specifications. A model, or flow chart, was developed to designate the participants, processes, and the sequence of decisions involved in the preparation of educational specifications for small schools. Explanatory notes to describe each step in the model were prepared.
4. The appraisal of the model, together with its explanatory notes, by a panel of jurors. The panel included superintendents, selected because their school districts or systems included a number of small schools, and others chosen because of their expertise in the areas of facility planning and/or small schools. The Jurors were asked to appraise critically the model as a useful aid to a group planning a small school, and to point out what they felt were the strengths and the weaknesses of the model and its notes.

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Organization of the Study

Chapter I provides an introduction to the study, and includes statements of background, the problem, the purpose of the study, basic assumptions, and limitations and delimitations of the study. Also included are definitions of terms used in the study, a brief review of literature and related studies, procedures followed, and the organization of the report prepared.

Chapter II contains a dual review of literature and research. The first section reviews material concerning the need for, and purpose of educational specifications, while the second section reviews material concerning current trends and alternatives in curriculum and facilities that can apply to small schools.

Chapter III outlines the methodology of the study, indicating the way in which data concerning existing small schools facilities were gathered and tabulated. Also described is the development of the model, and the process for its validation.

Chapter IV reviews some aspects of the development of the questionnaire sent to the principals of small schools in Michigan, and discusses comments made by the principals. Data received are tabulated, and relevant trends pointed out.

Chapter V presents the model for the development of educational specifications for small schools. The model indicates a sequence of processes, suggests participants to be involved, and decisions to be made. Explanatory notes accompany the model, which is given in a form suitable for submission to a panel of jurors. The jurors were asked to evaluate the model on the basis of:

1. Their estimate of its adequacy and usefulness as a planning

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guide for a community planning a small school.

2. Whether they felt the model's use would have made any desirable difference to the facilities provided in schools planned in their areas.

Responses received from the jurors were reported.

Chapter VI outlines conclusions reached in this study, and lists recommendations for further research.

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CHAPTER II

REVIEW OF THE LITERATURE

Educational Specifications

The Development of the Concept

Gold (1970) reminded us in his study of school planning that every process of human endeavor is motivated by the hope of attaining a set of desired goals. The enormous effort and expenditure currently used by societies in developed countries in providing school buildings for the education of their young can only be justified in relation to the educational ends it is hoped to achieve (Sher and Tompkins, 1976).

In the post-Sputnik years escalating building costs combined with changes in technology, and a careful new look at some long accepted educational tenents, made the process of planning school buildings an ever more complex and important process. Economically, technologically, and educationally it had become imperative that educational facilities should be planned carefully and intelligently.

As a result, agreement grew among the educators particularly involved with facility planning, that an effective school planning process required the cooperative effort of the whole community, as well as professionals like educators and architects. The preparation of educational specifications, as written guidelines to be given to an architect who would design a building to house a particular, clearly described educational program, was seen as a task which could

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coodinate and focus the cooperative efforts of educators and the community they served, in planning a new school. The preparation of written educational specifications also provided the community in general, and educators in particular, with an ideal opportunity to closely examine some of the educational alternatives available, and to plan an educational program that specifically met the needs of their community. This concept took many years to develop.

The earliest school houses in the United States were simple structures, built by semiskilled workmen, using whatever materials were readily available. Often school was held in a building originally intended for some other use--such as a barn, chicken coop, wagon shed, or watchman's house (Sloane, 1972).

When architects were available, and were commissioned to design school houses, they, and their clients, were more concerned with the appearance of the building--its Greek or Gothic characteristics--than its suitability for a particular educational program. As Castaldi (1969) expressed it:

> During the latter part of the nineteenth century, schools were designed as architectural works of art rather than educational facilities. Schoolhouses of that period were outsized buildings, characterized by unfunctional and undifferentiated space organization, and unfunctional and non-creative design. Many such schools are still in use with their large corridors, and imposing lobbies, stately columns, and useless parapets. Architectural emphasis was clearly on shape, form, and style, not on the functional aspects of school plants. (p. 11)

Although Sullivan, an eminent American architect, as early as 1880 had ennunciated the principle that "form follows function," there does not seem to have been any concerted effort on the part of educators and architects to cooperate in school plant planning until well into the twentieth century. Even then it was not until the building

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surge that followed World War II that functional school buildings became the primary goal of both educators and architects (Castaldi, 1977).

Possibly the first American to recognize the need for school facilities to relate to, and support, a particular educational program was Henry Barnard, an educator who served as Commissioner of Public schools in Rhode Island, but whose contribution as a designer of schools was possibly his major service to the development of education in the United States. McClintock (1970) wrote of this associate of Horace Mann,

> He brought architecture and pedagogy into cooperation, and through this cooperation he determined the characteristic concerns to which designers of schools must still attend. (p. 6)

McClintock claimed that Barnard illustrated the difference between an architect and a builder, in that "he took great care to explain the spiritual impact of the child's physical surroundings." In his grasp of the importance of the psychological environment in which learning took place, and the need to design a school building to house a particular educational program, Barnard appears to have been ahead of his day.

In fact, even in the 1960's and early 1970's it was not always acknowledged that there was need for cooperation between educators and architects in designing school facilities. A search of literature revealed that there was still a wide diversity of practice with regard to the process by which schools were planned. There appeared to be a continuum from the one extreme of leaving the entire process to an architect--who would design a school according to his own concept of what a school should be, or on the basis of his study of other

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schools--to the cooperative development of detailed educational specifications by professional educators and a community, thus leaving the architect the creative act of translating the specifications he had been given into an architectural design.

The desirability of clear specifications, describing the planned educational program for the architect, who in turn would design the building to house it, was expressed some time ago. In 1919, Charles H. Judd, in an address entitled "Educational Specifications for School Buildings" said,

> If school buildings are put to accommodate a certain educational program, is it not desirable that the educational program should at the same time the building is erected be specified with the same degree of clearness as the architectural and material considerations which enter into the plan? The architect describes minutely the material which is to be used in the building and gives all the dimensions and working arrangements, so that there can be no doubt at all as to his intention in the plans which he has drawn up. There has been, however, up to this time, a very great lack of what we may call educational specifications. (quoted in Roaden, 1963, p. 34)

However, the practice of preparing such specifications did not gain wide acceptance for some time, for Wilson (1955a) in one of the earliest scholarly studies of educational specifications stated that while the concept of using such specifications had developed in the 1920's, the actual practice of preparing them had only become widely known in the 1950's. Wilson himself helped to spread knowledge about the preparation and use of educational specifications by preparing a series of articles, published in the same year as his doctoral dissertation (which was also about educational specifications), in The Nation's Schools.

After 1960 many articles, books, and dissertations concerning

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educational specifications were produced, all stressing the importance of the specifications as an integral part of the planning process. Yet their use was still by no means universal. Isler (1970), in a study of nineteen districts in Wisconsin that had planned new facilities in the previous eight months, found that although there was considerable participation in the planning of the new schools, educational specifications were either nonexistent (in eight cases) or of a poor quality.

More recently, Miller (1972), in a study of the planning of six elementary schools in Indiana, found that complete educational specifications had been prepared in only one case. After a review of literature, and a series of interviews with architects who had used educational specifications in the designing of school facilities, Benson (1973) concluded that educational specifications were an essential part of the planning process for new educational facilities, and that architects preferred to have educators develop a written document describing the educational program and requirements for the new facility. Many other writers have agreed with Benson's evaluation. Roaden (1963) said educational specifications were "vital" to the planning process; Steeb (1976) that they were the "vehicle" for effective educational facility planning; Earthman (1976) that they were a "planning tool" for both educator and architect, providing a "springboard" from which the architect's imagination enabled him to solve the design problems involved in creating a new school facility. The Council of Educational Facility Planners, International (1976) claimed that "the most important pre-design activity is the preparation of program requirements or educational specifications." (p. D-6)

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There appeared, then, to be a strange discrepancy between the theory, in which there was wide agreement that educational specifications were desirable, and in fact essential for the effective planning of school facilities, and the practice, in which such specifications were often meagre and inadequate, or even completely lacking. It seemed likely that their use would gradually increase, however, as their preparation was more and more often being required by policy (and even by law) in a number of states (Steeb, 1976).

Basically, then, educational specifications were valued as a means of informing architects of the educational philosophy, student characteristics, and desired educational program for which a particular facility was being planned. However, as Roaden (1963) pointed out, the process of preparing the specifications, and the completed document itself, could serve a number of important incidental purposes. These included:

(a) to stimulate curriculum improvement

(b) to define existing educational programs and identify desirable future programs

(c) to give written expression to a community's values and educational philosophy

(d) to express the hopes and desires of the community for the future of its youth

(e) to serve as a basis for inservice training of teacher personnel

(f) to serve as a basic reference to the operation and function of the resulting educational facility.

It followed that the process of planning a new facility, and of writing educational specifications, accorded a community and

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professional educators with an excellent opportunity to review current educational programs, rethink accepted educational practices, and critically examine relevant trends in curriculum and educational technology.

The Need for Educational Specifications in Small School Design

A consistent aspect of modern times is the prevalence and speed of change. That has been less true, perhaps, in the area of education than in the fields of science and technology. However, education could not but be influenced by the kaleidoscopic and accelerated change taking place, and as Landrum (1964) suggested, the greatest change in education has been seen in the lessened resistance to change.

This change in attitude was clearly seen in the design of postwar schools. There was a time when a "classroom" was quite clearly defined, and varied little irrespective of the learning process it was to house. Writing of that era, Wilson (1955b) said that up until a few years before almost the only information architects received (and, indeed, felt they needed) from school officials before starting to work on a school plan, were, firstly, the number of children to be housed, and secondly, the approximate amount of money available. But the situation changed, even for small schools. Meiborg (1970) made a comparison between Iowa school buildings in 1919 and 1969, and concluded that recent buildings were "markedly different" in building materials, methods of construction, and design and appearance. Meiborg found that church architecture strongly influenced school design up to the 1920s (a period when most schools built

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were small, and in most cases of one room), but that from that time onwards some architects specialized in school design, and further that there had been a clear change in the philosophy of schoolhouse design since World War II. School buildings were now planned, he said, for the particular educational program to be housed.

Caudill (in Landrum, 1964) pointed out that the schoolhouse, as an architectural form, never had been (and never would be) crystallized. There had, he pointed out, been trends, like the use of glass bricks in the 1950's, and the use of zigzagged roofs and of circular schools in the 1960's, but never a rigid form. Caudill suggested it would be better to have another name, other than "classroom" for subdivisions of educational space, in that "classrooms" could now be of any size, shape, or volume, particularly suited to some specific type of learning (Caudill, 1954; Landrum, 1964).

Never before had there been so many alternatives in design, materials for construction, and in equipment and furnishings; nor in curriculum, and educational technology. This wide variety in both programs and related facilities made it more important than ever that communities carefully state the educational goals they wished their school to attain. The community could consider the alternatives available in curriculum and technology, and carefully outline the school program they wanted for <u>their</u> children. They needed, then, to make sure that the facilities they provided would serve that program, but at the same time be flexible enough to adapt to new ideas or to expand to serve increased shool populations. No longer could schools be expected to remain unchanging, while the children that passed through the system were changed by it. Now, the school, too, had to

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be responsive to changes in society, and to the expectations of the community it served. Flexibility and adaptability had become qualities of great importance; and they are qualities that can particularly be designed into small schools (Leggett et al., 1977)

A particularly useful report on educational specifications for elementary schools, prepared for the Metropolitan Toronto School Board in 1968 summarized the school's relation to change as follows:

> There is now growing support for the idea that the rate of change within the education system should correspond to that of the total environment. But the attainment of this goal would involve the realignment of the total educational structure. Such realignment will not occur so long as we continue to rely upon ad hoc or short-term approaches to the solution of problems. It demands the development of long-term systematic, and highly predictive methods of educational planning. The need for sound forecasts of future educational requirements makes it mandatory that we commence now the gathering of reliable data and estimates. This would require the processing of data concerning such matters as curriculum, learning requirements, teaching functions, psychological and biochemical approaches to learning and memory, equipment needs, educational financing, and school building design requirements. (p. 201)

Clearly the planning of any school, of whatever size, must involve a careful weighing of present demands, and possible future needs.

In 1974 the North Central Association published the report of The Committee on Small Schools, under the title The Small School: Returning to the Human Dimension. The report outlined a number of potential strengths of small schools, making it clear that the "strengths" were, in fact, only potentials which "can prove to be deterrents to effective education unless they are capitalized upon creatively" (p. 5), and that, conversely, the "weaknesses" allegedly inherent in small schools "can be diminished, circumvented, or even reversed by educational imagination and flexibility" (p. 1).

Sher and Tompkins (1976), in a survey of literature and

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research concerning small schools and school districts, gathered data which they claimed dispelled "myths" concerning the supposed economy and efficiency of large schools in comparison with small schools. They would agree with Loustaunau (1975) that small schools can have rich and adequate programs. But such richness, like the flexibility mentioned earlier, will not come by chance. It will be the result of careful planning.

Cyr (1958, quoted in Yulo, 1963) suggested that within reason, the smaller the school the more responsive its program could be to change. The small school was less likely to be bound by bureaucratic regulations and red tape, more able to introduce innovations that could achieve the educational objectives of the community. The administration of a small school had the potential to adapt quickly to change. As the North Central Association pointed out in its report (1974), the staff of a small school could sit down together and hold a planning session, or meet with members of the community to discuss alternatives, and make decisions to put into immediate operation.

But to realize the potential for such flexibility, the facilities provided in the small school must themselves be flexible. Cyr used the analogy of an automobile and a train to emphasize qualities which he said existed in small and large schools. A train, like the large school, was developed, he said, on the principle of specialization, with a string of specialized units, such as a locomotive, passenger cars, diners, sleepers, and baggage cars, loosely coupled together. Trains, he suggested, are ideal for transporting large groups of people on predetermined routes. But they cannot adapt their programs to meet individual needs. An automobile, on the other hand,

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is self-contained and versatile, able to respond to changes in the wishes of the driver and passengers alike. Cyr suggested that small schools needed distinctive designing, just as did automobiles--which would be of little practical use were they merely scaled models of trains.

Holt (1977) had the same versatility and flexibility of small schools in mind when he wrote (in typical style),

> To people who are thinking of starting new schools, . . . my strong advice is, keep that school as small as possible, the absolute minimum that the law will allow and still call it a school. The problems of schools, the difficulties of running them, the troubles they get into with the authorities, seem to increase, roughly, with the square or maybe the cube of the size of the student body. Four or five kids can go anywhere with an adult; a dozen gets to be a problem; two dozen is a big problem; and for forty to fifty you have to get a permit from City Hall. Keep it small, keep it cheap; there's no other way to go. (p.2)

Because the social organization of a small school was seen to be so adaptable, it followed that to gain optimum benefit from this potential the facilities, too, had to be flexible. It was not, then, less important that a small school should be carefully planned, but on the contrary was of special importance that the facilities should be purposefully planned so that the potential strengths of a small school could be realized (Leggett et al., 1977).

In addition to the flexibility of the program within a small school, and the ability of the staff to implement desired changes (given flexible facilities), a further strength stressed was the interest of the community in the program of a small school (North Central Association, 1974). This potential could best be realized by gaining community involvement in planning an educational program suited to local needs. The preparing of educational specifications

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could afford an excellent opportunity for the local community to participate in planning an educational program, and in the case of a small school the whole community could be involved. At the same time the preparation of educational specifications could serve to make the community aware of the inevitability of future change, and the need to make allowance in the design specifications for the flexibility that would make adaptability to change possible. It was seen as the responsibility of the professional educators and consultants to make sure that the community was aware of, and made allowance for the needed flexibility in their school (Alaska Department of Education, 1977; Michigan Department of Education, 1975; North Carolina Department of Public Instruction, 1964, 1975; Pearson, 1975).

School buildings last many decades, and it was conceivable that the educational program housed in a building might change radically several times during the life of the building. Graves (1971) claimed that nationwide there were approximately 250,000 classrooms which had been in use for more than fifty years. There is nothing in the literature to suggest that small schools do not last as long as larger schools, or that they do not require careful planning, just as larger schools do.

Rather, the emphasis in the literature is that all schools need to be carefully planned and designed to meet the needs of the present and be adaptable to the needs of the future. Such flexibility could best be assured if it was carefully planned and documented in educational specifications. It is clearly implied, therefore, that small schools do require educational specifications as part of their planning process.

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The Preparation of Educational Specifications

Educational specifications are educational documents. Their preparation was therefore seen as the responsibility of educators involved in the planning process for a new school. It was their responsibility to initiate, guide and sustain the efforts of the various groups involved, and produce the written document that would be passed on to the architect (Castaldi, 1977, p. 152).

The major responsibility was seen to rest with the superintendent of schools, or his equivalent in the systems of private schools. He might, in turn, delegate a part (or even the whole) of the tasks involved in the planning process to subordinates (Castaldi, 1977, p. 216). Some large districts listed in the Michigan Education Directory and Buyer's Guide 1977-1978 had particular assistants to the superintendents responsible for, perhaps, plant planning and maintenance. The Michigan Department of Education had a Supervisor in charge of School Organization and Plant Planning, part of whose task was to give help to groups planning new schools.

Unfortunately, it appeared that some educators well placed to make a significant contribution in the planning process were not given opportunity to contribute as they could. Isler (1970), in his study of school planning in Wisconsin, found that the major contributions in the planning process were perceived by the planning group to have been made by superintendents. Other participants (notably teachers) had only, in their own estimation, been able to make minor contributions, and (with the exception of principals) only in specific areas.

Miller (1972) studied the planning process for six Indiana schools, and concluded that the superintendent was the active leader

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and chief decision maker. The superintendents and architects involved in the cases studied felt that only minimal written specifications were necessary. However, principals and teachers in the schools expressed a definite need for more specific written contact with the architect, and teachers in particular felt that their input had been minimal. It was of interest that three of the six schools studied were not being used as intended by the designers, and less flexible facilities would have proved a serious problem. Miller's conclusion was that while good buildings could be built with minimal written specifications, better buildings required adequate participation, and carefully written directions.

Writers about school planning recommended a broad involvement of professional and community participants in the planning process. Wilson (1955a) suggested that community leaders, educators and architects should cooperate in the process. Reeves (1969) did not appear to include the community at large when he suggested that administrators, educators, consultants and architects should work together. Stenzler (1972) drew an analogy from the world of business, where employees were increasingly involved in decision making, and suggested (particularly for a high school) that students should be included in the planning group. He concluded that students could make a substantive contribution from the fresh insights they could bring to the planning sessions, and would benefit from their experience. The Council for Educational Facility Planning, International (1976) pointed out:

> . . . because schools exist to serve a community, the community should have a voice in school related decisions.

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> Therefore, facility planning is a team effort which requires not only technical expertise, . . . but also human relation skills. (p. A-6)

There was a clear concensus in the literature that a team approach was the most effective one in planning an effective school (Earthman, 1976; Steeb, 1976; Streeter, 1977). Writers stressed that the specifications should be produced by educators as a means of clear communication with architects; but it was equally stressed that the community should be involved, in that, as Steeb (1976) expressed it, the specifications "must first include the districts' and school's basic educational beliefs (p. 40)."

It was clear, then, that there could not be restrictive rules which would rule out any group of potential contributors. As Roaden (1963) emphasized, instructions concerning the preparation of educational specifications did not say what should be done, but only what could be done. The educators responsible for the preparation of educational specifications, then, were free to involve as many of the teachers who would use the completed facility, and as wide a representation of the community as they could. Where possible they might gain the cooperation of students (even elementary pupils could contribute ideas on topics such as the most desirable type of playground for the school). Also likely to be involved would be educational consultants, legal consultants and financial experts, and architects (North Carolina Department of Public Instruction, 1964, 1975).

Wilson (1955d) recommended the use of a committee, to meet periodically over a considerable period of time (as short as three months, or as long as a year) to gather data, consider alternatives, and agree on the final draft of the specifications. In this work, he

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said, "the superintendent, as creative educator rather than as mechanical administrator, becomes a dominant factor (p. 67)." Others have agreed that a committee afforded the optimum setting for the interchange of ideas. The process most widely recommended has involved the organizing of a planning committee (either by the community, or by action of an existing board) and for it in turn to establish a number of sub-committees to study particular aspects of the new school, and to bring recommendations to later meetings of the planning committee (Alaska Department of Education, 1977; North Carolina Department of Public Instruction, 1975).

The Content of Educational Specifications

In urging that educational specifications be prepared fully and carefully, Castaldi (1977) wrote:

> The greater the detail and clarity of the educational instructions prepared, the greater will be the likelihood that a school district will acquire the school building it really needs. (p. 153)

The major purpose in preparing educational specifications was to help the architect gain an adequate concept of the educational program the new school building was to house, and to make him aware of the direction of possible future change. It followed that the specifications should contain all the information needed to enable the architect to complete his design. The actual content of educational specifications, then, was likely to reflect the wide variety in educational programs, and no immutable rules could be laid down.

However, there has been considerable agreement concerning the type of information needed. As early as 1919, Judd urged that the educational program to be accommodated in a particular building should

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be "specified with the same degree of clearness as the architectural and material considerations which enter into the plan" (quoted in Roaden, 1963, p. 34). In 1925, however, the National Education Association asked only that a "schedule of rooms" should be prepared as a part of the process of planning a school building (Roaden, 1963). More recent writers suggested it was totally inadequate to describe a space merely as a "general classroom" or a "laboratory", and suggested that actual activities to be carried out in a particular space should be described (The Metropolitan Toronto School Board, 1968).

Wilson (1955c), in the second of his articles regarding educational specifications published in The Nation's Schools, suggested three major areas:

1. Philosophy and curriculum
2. Administrative organization
3. Noninstructional service requirements.

The more detailed listing of possible content which he supplied provided a rather complete range of items likely to prove useful to the architect--and would need little revision to serve as a useful guide over twenty years later. For example, under the heading "Detailed Statements of Desired Spaces and Educational Program" he listed:

INSTRUCTIONAL SPACES
Required numbers and kinds of rooms
Descriptions of the program, functions and facilities for each room
- Sizes and kinds of groups to be accommodated
- Teaching methods
- Types of class activities
- Location and relationship to other facilities
- Physical arrangements and features
- Descriptions and lists of the equipment, furniture and materials

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NONINSTRUCTIONAL SPACES
Required numbers and kinds of rooms
Description of the functions and facilities for each room
Sizes and kinds of groups to be accommodated
Types of activities to be provided for
Location and relationship to other facilities
Physical arrangements and features
Descriptions and lists of the equipment, furniture and materials. (p. 76)

In 1963, when Roaden wrote his dissertation on the essential elements of educational specifications, he summarized his findings by listing the following as essential elements:

(a) the problem
(b) statement of educational philosophy and objectives
(c) type of school and organization
(d) general enrollment policies
(e) description of those to be served
(f) community use
(g) general trends
(h) general environment
(i) auxiliary services
(j) general area relationships
(k) desired educational outcomes
(l) discernible trends
(m) activities
(n) specific enrollments
(o) space needs
(p) furniture and equipment
(q) special requirements (pp. 118-19)

Additional elements not rated as "essential" by the panel of experts Roaden used, but considered to be desirable, were:

(a) the planning process
(b) traffic
(c) summary of space requirements
(d) the limitations and requirements under which the architect must work
(e) a general description of the site
(f) storage requirements
(g) desired space relationships within each department. (p. 120)

A comparison of Wilson's (1955a; 1955b; 1955c; 1955d) and Roaden's (1963) suggestions showed that Wilson expected the specifications to give more specific structural and mechanical instruction, such

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as specific hardware and lock systems, floor and wall surfaces, fire alarm systems, and the like. Roaden anticipated a clear outline of needs, but expected the architect to suggest the solutions.

This change in emphasis was further developed in McFarland's (1967) study of the expectations architects had with regard to educational specifications prepared for them. Items in his questionnaire for which he received at least 90 percent agreement from the responding architects were:

1. The architect needs a description of the educational program (activities, groups, and equipment) (100% agreement).
2. Reasonably ample time must be allowed the architect after presenting the written educational specifications in order for the architect to prepare preliminary design (98.9% agreement).
3. The client should describe the current educational procedures they wish considered (96.8% agreement).
4. The client should describe anticipated future program development (96.7% agreement).
5. The client should describe trends they wish provided for in design (94.7% agreement).
6. The client must provide a complete description of how the building will be used (92.5% agreement).
7. The client should recognize that true economy is a complex relationship between original cost, educational utility, and maintenance and operational expense (91.4% agreement). (p. 2033)

Items ranked lowest by the architects dealt with such possibilities as clients specifying particular furnishings, providing sketches, or giving word pictures of how space would look. McFarland's conclusion was that architects desired problems to be clearly outlined, but did not want educators to specify solutions.

Steeb (1976) tried to give a very broad pair of categories when he suggested that educational specifications have two components. The first, he said, should detail the instructional program in concise, written statements, including philosophy, goals and objectives, activities, and course titles and content. The second component, he

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said, consisted of a description of the physical and environmental factors for the program identified, listing facilities needed, equipment and furniture, and any other special considerations that would affect the design. Steeb only restricted his outline of content to two components by including a variety of items within each component.

A particularly clear, concise, and comprehensive statement of desirable content, given by Earthman (1976) listed:

1. Educational situation and student body served
2. Orientation and nature of the project
3. Community to be served
4. Educational philosophy of the district and staff
5. Educational trends
6. Site
7. Functional relationships of the facility
8. Nature of the teaching/learning process to be carried on in the facility
9. Space requirements in square footage
10. Specialized facilities for vocational education, science, physical education, etc.
11. Indoor and outdoor recreational facilities
12. Building communication and utility requirements
13. Furniture and equipment
14. Plant service areas and facilities
15. Parking (p. 8)

Writing for the Journal of Adventist Education, the official journal of the Seventh-day Adventist school system which operates close to 1,000 small schools in North America (and many times that in other parts of the world), Streeter (1977) suggested the following characteristics as the basic structure of educational specifications:

1. A brief description of the various learning activities in which the goals or objectives are stated. Attention should be given to trends that may be developing in particular subject or curriculum areas involving new or innovative ideas.
2. A statement of the number, nature, and grouping of individuals involved in the various learning activities. Particular activities requiring specific spaces and facilities could be identified. Consideration should be given to immediate as well as long-range needs relative to enrollment projections.

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3. A listing of space requirements. These should be expressed in terms of square feet needed for each area. No attempt should be made to describe detailed dimensions or specific building materials. Desires storage needs, work spaces, or teaching requirements should be identified.
4. A diagramatic chart or illustration of the desired space relationships. This should be summarized in a matrix or bubble-type diagram. It should include a relationship of the facility to the site and the interrelationship of the various instructional and noninstructional activities to each other.
5. A listing of the major items of equipment or furniture or any special environmental needs. Particular care should be exercised on recommendations that are based on safety, economy, and flexibility and that may result in the promotion of staff efficiency. (p. 17)

Few references were found in recent descriptions of the content of educational specifications to a statement regarding the financial expectations of the clients. Wilson (1955a) did recommend that such information be given. It was noticed that in most of the actual documents seen in the course of this study, there was such a statement, giving the architect an idea of the funds the clients had available and expected to invest in the new facility (and hence the cost per square foot they envisaged).

Current Trends in Program and Design

Introduction

A 1960 study by Educational Facilities Laboratories counseled educators, architects, and citizens engaged in school planning as follows:

1. Anticipate--schools are usually planned too fast.
2. Think of what you want the school to produce before you decide what to put in it.
3. Don't plan in isolation--your neighbours have the same problems.

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4. Don't buy permanence at the expense of performance. We are in a period of rapid cultural change; don't saddle a community with unchangeable schools that will some day "sit beside the road, a ragged beggar sunning" (Educational Facilities Laboratories, 1960, p. 138).

Castaldi (1977) has added two new terms to the vocabulary of school planning, namely "gradualism," and "reversibility." By "gradualism" he indicated a concept of slow progress, rather than a rush to discard all from the past in a desire to grasp the new. He recommended building on what had proven successful in the past, seeking at the same time to anticipate what would be successful in the future. By "reversibility," Castaldi meant that a school design should not commit a school irreversibly to some new educational program, but rather should provide, along with what was new, the possibility of revitalizing some proven program from the past. Castaldi was thus encouraging versatility and flexibility, but not radical change.

Leggett (et al., 1977) expressed a similar desire for controlled change, with a strong element of the aesthetic included:

> The next generation of elementary schools must attempt to link spaces graciously, vary in ceiling height or floor depth, relate to the outdoors effortlessly, and resemble a real landscape--varied, inviting, beckoning one to enter. It will allow groups to come together. It will provide enclosure for variety and fun. It will have style instead of monotony. That is the kind of charge school districts ought to make to architects. (p. 93)

The following section outlines some of the alternatives and trends in school programs and design that planning committees (and, for that matter, communities) should be aware of when a new school is being planned. Items are introduced in alphabetic order, and so

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no ranking of the items is intended.

Compactness

A "compact" building is one in which the perimeter is small in relation to the area of the building. Charles Day (1970) made a study of both the theory and practice of "compactness" as a feature of school design. He showed that in theory a circular building was the most compact, and the more right angles there were in the perimeter walls the less compact the resulting building would be.

Day's research led him to claim that compactness contributed to a reduction of the initial cost of buildings. The saving, he said, was attributable to reduced perimeter, reduced corridor space, reduced cost for mechanical equipment, and higher utilization of space.

Learn (1967) studied the relationship between plant expense (operation and maintenance costs) and the compactness of elementary school buildings. He found a significant inverse relationship between plant expense and building compactness (+.53, significant at the .05 level), suggesting that the more compact a school building, the lower the maintenance and operating expense.

Figure 1 illustrates clearly the way in which the shape of a building can vary the ratio between perimeter walls and total area. Planning committees should consider the quality of compactness in developing educational specifications, although the actual design shape is the creation of the architect.

Educational Technology

Marshall McLuhan was quoted in 1967 as claiming that instruction, as such, was unnecessary in the electronic age:

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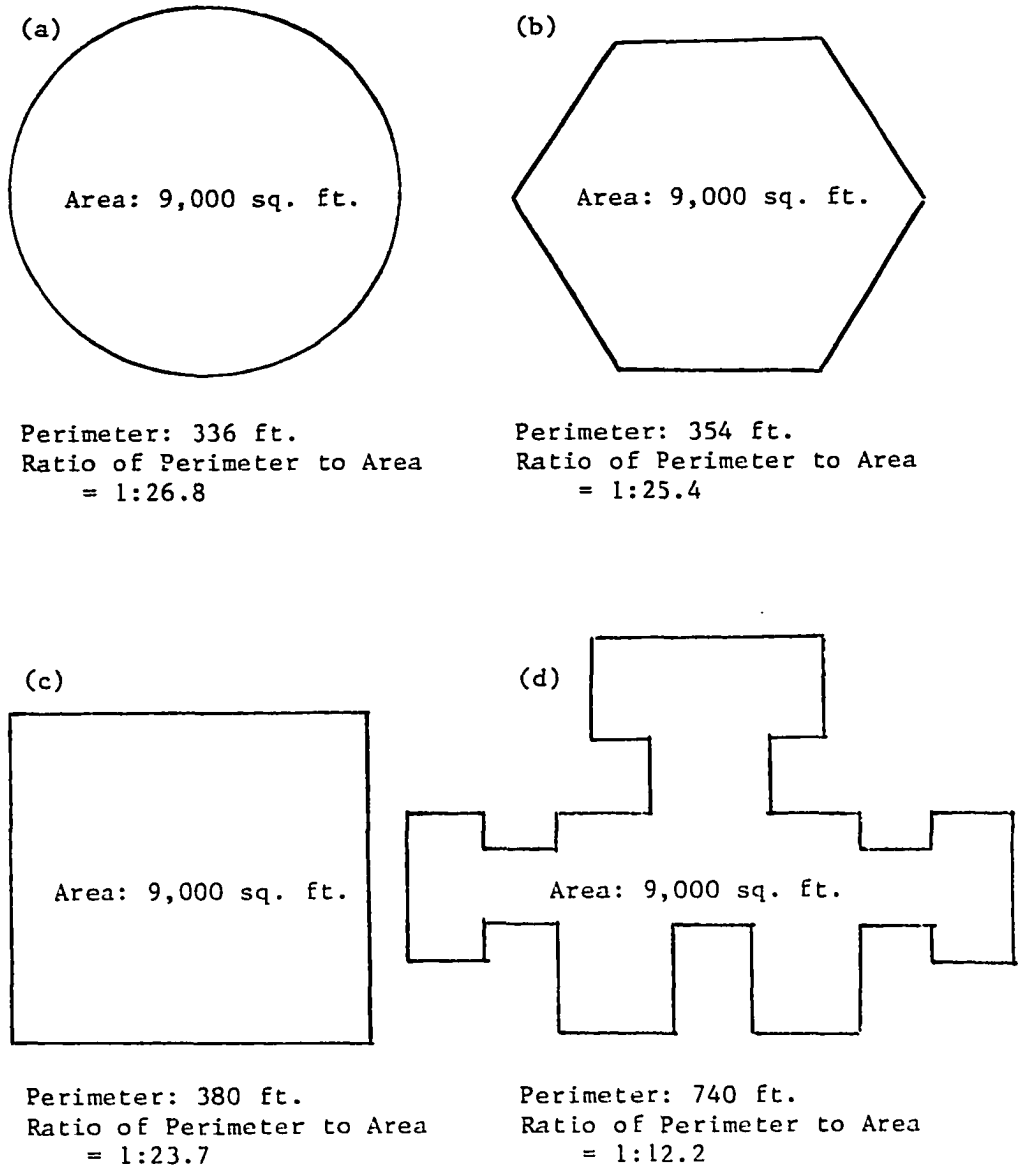

Fig. 1. The effect of shape on the ratio between perimeter and area (i.e., on compactness).

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> Schools are penitentiaries, interfering with the education of the students. . . . The instructional process has had it. There will be no instruction in our schools in a very few years. Five years, if you want an estimate. (quoted by Harry J. Boyle, 1967, p. 2)

School instruction continues over five years beyond the time McLuhan predicted it would survive. It is true, however, that an increasing use has been made of new educational technology. Day (1970) did not consider technology could replace the teacher, but rather saw its task as two-fold; firstly, to attract and motivate the student, and secondly, to relieve the teacher of "tiresome tasks and drugeries" that inhibit the teaching process. Jackson (1969), who has specialized in observing what teachers <u>did</u> in classrooms, suggested,

> . . . changes in the teacher's work resulting from the new technology are not likely to be revolutionary, . . . and, second, . . . the anticipated changes may have either enriching or impoverishing effects on classroom activity, depending, in part, on whether they have been guided by a concern for the quality of education, or for the economy of running schools. (p. 147)

> . . . When the school bells ring on some crisp autumn morning twenty or thirty years hence, teachers will probably still be on hand to greet their students and lead them into classrooms where life, then as now, will be more animated than automated. (p. 152)

Keppel (1966), former dean of the Harvard School of Education, accepted the potential for benefit that educational technology provided, but had serious reservations about the use being made of technology in the United States. He claimed that technological innovation was producing new devices at a rate that made it impossible for teachers to gain the expertise that was necessary for effective use.

The situation was that in many schools thousands of dollars' worth of equipment was stored in basements, or was little used, while the problems the equipment was expected to solve still persisted. The

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result was a waste of funds, and teacher frustration (Metropolitan Toronto School Board, 1968).

Modern aids to teaching included not only a wide variety of printed materials, but an ever increasing selection of sophisticated electronic devices had entered the market. Some of the available aids were programmed, so that once the machine was switched on, it required no further attention from the user. A further step was taken with the introduction of Computer Assisted Instruction (CAI) and Computer Managed Instruction (CMI), in which programmed computers could respond in a variety of ways, as induced by the user's answers. Further innovations such as dial-access information retrieval systems, and "student response" systems (in which each student would have a selection of buttons to press in response to questions given the class, immediate feedback being provided for both the teacher and the class) were being developed, and had great promise (Castaldi, 1977).

Educational technology had a dual potential for aiding learnin the school. Firstly, it could improve large group instruction through the use of such aids as the overhead projector, radio, 16 mm and slide projectors, and television. Secondly, it could enhance individual instruction through the use of such equipment as cassette recorders, slide projectors, microfilm, and various programmed materials (Metropolitan Toronto School Board, 1968).

A major contribution of educational technology was that it eliminated boundaries existing between school and the "real" world. Technology made it possible to bring experience and information from other times and remote places directly to the student. The well equiped school, though it be small, could "become an open door to the

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world, rather than a cloister which shuts the world out" (Metropolitan Toronto School Board, 1968, p. 54).

An interesting innovation was the Bell Telephone Company's Telexplorer Field Trips by Phone program, in which the telephone was used as an inexpensive way of bringing students into contact with people and places otherwise inaccessible to them. Applications quoted by the Bell Company included a fourth grade class studying geography which talked with another fourth grade in Alaska, and an English class which spoke with the author of a book they were studying (Bell System brochure SP4011, 1978).

Flexibility and Adaptability

Although there was not complete agreement on the use of these two terms, most writers (Castaldi, 1977; Caudill, 1969; Leggett et al., 1977; Pearson, 1975; Phillips C. W., 1974; Testa, 1975) used the term "flexible" to describe a building designed so that changes could easily and immediately be made--perhaps using mobile furniture, operable walls, or some such technique--so that the activities of a markedly different nature could be carried out in a particular space. The term will be further clarified below.

On the other hand, a building was said to be "adaptable" when it was designed in such a way that it would be relatively easy to make major structural changes, such as extensions, or changes to permanent walls, at some future time. Flexibility, then, related to the needs of a richly variable school program in operation, and adaptability to provisions made in an initial building to help meet possible needs of the future.

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In writing concerning human characteristics and school learning, Bloom (1976) reminded educators that because of individual differences, great flexibility was necessary in the learning environment. He pointed out the need for flexibility in timing, in grouping, in materials, and in staffing patterns as well as in space. It is exactly in providing such flexibility that the small school has its greatest potential for providing an effective learning experience for its pupils. In this review the emphasis is on flexibility of space, although other aspects of flexibility are acknowledged.

Leggett (et al., 1977) suggested that there were two aspects of flexibility. One, the "technically marvelous ability of properly designed building space to respond to new uses," and the second, "the changing requirements that developments in education make upon space." The second aspect mentioned seemed to be moving in the direction of "adaptability."

Both Pearson (1975) and Testa (1975) pointed out that flexibility can essentially be of two kinds. The first was a "built in" flexibility, where a variety of teaching/learning activities, groupings of various sizes, and the like, could be accommodated in the variety of spaces provided in a building. That would require that spaces (rooms, or areas) be built into the structure, so that the spaces of various sizes could house a varied program. The second kind mentioned was what Testa called "mechanical" flexibility, provided by movable walls, open space, or some such design, and flexible furnishings.

A rather striking example of the first kind of flexibility

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mentioned above was illustrated in a Boston school described by Holt (1975, in David and Wright, editors) as follows:

> . . . housed in two old houses, tall and narrow, five floors and a basement, joined together at every floor to make one building. From the point of view of almost any school architect, the building is a disaster, full of "wasted" space, "unusable" space--stairs, stair landings, little corridors, closets, bathrooms, tiny rooms too small to use for any recognizable school purpose. And these spaces, as much as anything else, have been the making of the school. A great deal goes on in them. In and on those stairs, landings, corridors, and corners, students meet, study, talk, argue, and dream. The tiny closets and bathrooms have been made up into private studios which the older students sign up for and decorate in various personal and eccentric ways. (p. 144)

It is unlikely that all teachers could feel at home teaching in such an environment; but the provision of individual study areas, small and large group areas (either zones or separate rooms) and large instructional areas, was an idea popular with many students and teachers, and some architects too (Pearson, 1975).

C.W. Phillips (1974), writing concerning the use of industrialized building systems, in which prefabricated sections, or modules, were used, suggested that the flexibility of a building was really the "number of options" it gave the client--the variety of ways it could be used to attain the educational objectives sought. Obviously, the open space concept, where an absence of internal walls and mobile furniture combined to make an almost limitless number of arrangements possible, presented a high degree of flexibility. However, such "undifferentiated space," as Pearson (1975) called it, was considered likely to be expensive to build in that (a) more space per pupil was required (although Testa [1975] questioned that was necessary), and (b) the quality of environmental control necessary for its success was expensive. Furthermore, there was a danger, as

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Pearson (1975) and Testa (1975) both pointed out, that unless open space was carefully designed it could be educationally sterile and lack aesthetic appeal.

What was desirable, according to Pearson and Testa, was flexibility to the extent that the spaces created could be varied easily and quickly to allow for varied acticities in the school program, while still retaining sufficient attractive variation in the visual field. Also to be considered in the design were other environmental factors such as thermal and acoustic control (Pearson, 1975; Testa, 1975).

Testa also gave evidence that the flexibility provided in a building should become the subject of instruction and inservice for teachers (a possible use of the educational specifications once the building was completed). He quoted an instance from California where the School Construction System Development Project completed a number of carefully designed, industrially produced school buildings. Not long after the new facilities were in use a survey showed that only 47 percent of the faculty knew that interior partitions could be moved, and only 18 percent knew the lighting units in the ceiling could be arranged in different patterns. Flexibility is only a potential good, that must be recognized and used to be of value.

Flexibility is related to the particular educational program to be housed immediately in a building, and less to possible future changes in curriculum--although likely future trends might well be taken into account in designing the flexibility. Adaptability, however, is related to probable future needs, and not to the present. For this reason the provision of adaptability could become a sensitive

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issue. Pearson (1975, p. 26) said, "We should not sell the present short for the sake of an uncertain future." C.W. Phillips (1974) said:

> One of the most formidable problems in the provision of adaptability and in subsequent adaption seems to be the problem of preserving the essentials of the environment provided by heating, lighting and ventilation. . . . to make adaptation as economical and easy as possible, it is difficult to avoid the tentative conclusion that it may be necessary to veer toward adopting the principle of a controlled environment. . . . air conditioning and reliance, at least in part, on artificial as distinct from natural light. . . . There may be additional capital costs incurred in providing for adaptability in a building when it is initially designed and this will have to be measured and set against the cost of adapting the building at a later date. (p. 16)

Testa (1975) recommended that planners give thought to the design of "multi-use school" buildings, capable of easy adaptation to a variety of uses, even noneducational ones. He suggested that such buildings might serve a variety of uses even while they were schools (such as community centers, or cultural centers) and might later be adapted to become offices, or some other commercial building. Clearly there was a balancing necessary, weighing immediate needs, costs, and possible future needs.

Both Whitehead (1967) and Pearson (1975) claimed that when flexibility and adaptability were carefully considered during the pre-design stage, they could be incorporated in the building at little or no extra cost.

Individualized Instruction

Instruction was said to be "individualized" when each pupil's rate of development, intellectual ability, past experience, interests, and learning strategies were taken into account when planning his educational program. In the first half of this century such

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differences were often managed by having students repeat grades. More recently there was an increasing emphasis on meeting the individual child's needs--and not merely by varying the rate at which the same material was presented, but by adapting the content and materials of education to suit individual needs and interests (Glaser, in Committee for Economic Development, 1969; Blair, Jones and Simpson, 1975, chapter 6).

Educators such as Goodlad, Glaser, and Holt strongly supported the move toward individualized instruction. Holt (1965) wrote,

> The alternative--I can see no other-- is to have schools and classrooms in which each child in his own way can satisfy his curiosity, develop his abilities and talents, pursue his interests, and from the adults and older children around him get a glimpse of the great variety and richness of life. (p. 180)

By the 1970's there was "generally a heavy emphasis on small group and individual learning in addition to large group activities" (The Council of Educational Facilities Planning International, 1976, p. G-6), and such an emphasis was reflected in school design and furnishings. In many schools an enlarged instructional media center (a library with broadened functions) was located centrally, and there was increased provision of individual carrels and study areas both within the media center and around it. Legget (et al., 1977) suggested a "turf" concept, where a basic unit of the school was a turf, or cluster of carrels, to serve as a home-base for four or five students, with flexible programming that allowed them to spend much of the day in individual or small group activities.

The literature revealed degrees of individualization, with various methods and materials relating to each of a number of different approaches. Skinner's "autoinstruction" using teaching machines

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and programmed learning arranged in graded steps of logical sequence represented one type of option; Computer-assisted instruction (CAI), with its "sophisticated application of hardware to the instructional process" another; and the free development of individual interests through independent study, using a variety of media, a third (Blair et al., 1975, p. 159).

The concept of individualized instruction was one that had common overtones with some related educational approaches such as open education and nongradedness. The common factor was an increased appreciation and acceptance of the child's contribution in the learning process. Supporters of the new emphasis claimed distinct educational advantages in both academic and emotional aspects of the child's development. Dunn (1978) offered readers a complete bibliography of research that supported individualized instruction, and claimed that experience showed the benefits of an individualized approach.

The facility implications of individualized instruction were the provision of instructional resources (as in an instructional media center) and carrels for individual study and work. All schools will provide some materials for individual activities, but small schools are likely to provide for individualized instruction and activities even more than larger schools do.

Nongradedness

Paterson (1973) claimed that the slowness with which education as a whole was changing from the lock-step system of traditional schools was due primarily to the fact that so few knew what a nongraded

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school would look like, and how it would function. To support his claim that the concept of nongradedness was widely accepted, Paterson quoted the results of a then current Gallup survey in which 71 percent of the public and 87 percent of the educators polled had approved the concept of nongraded schools (but one wonders how clearly those who responded could visualize a nongraded school).

Paterson suggested that in a nongraded school each child was accepted and helped as an individual learner, each teacher was a facilitator (not a disseminator of packaged knowledge) and a learning counselor, and the curriculum was flexible and individualized. Each pupil learned at his own rate, with materials he preferred, and in a manner he chose. The mechanics by which the learning activities of the school would be organized were not explained.

Vogel and Bowers (1974) agreed that there was a lack of unity and understanding with regard to nongradedness. They said that nongradedness had often been confused with "ability grouping." To try and clarify the concept of nongradedness, they offered ten criteria:

(a) no grade labels

(b) a continuous progressive course of study in the skill areas

(c) organization of the concept subjects (such as social studies) in a cyclical manner

(d) continuous educational progression of all pupils with no grade failures or retention

(e) flexibility in pupil grouping which provided for the creation of groups for specific purposes

(f) multi-age grouping

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(g) flexibility in the instruction program to provide for intra-personal variabilities

(h) some type of staff program to facilitate flexible grouping patterns

(i) an abundance of multi media materials available

(j) a written statement of the school's objectives.

Of the self-styled nongraded schools they surveyed, Vogel and Bowers said that 48 percent met their criteria, 42 percent met some of their criteria, and 10 percent were "clearly not nongraded in reality". (p. 8)

Supporters of nongradedness have claimed that pupils in non-graded classrooms achieved at least as well, and usually better, than their counterparts in graded schools. Martin and Pavan (1976) set out to summarize research on a number of innovative programs, including nongradedness. They claimed:

> In all cases where students were matched for IQ, the nongraded achievement scores were significantly higher. In a comprehensive review of research on nongrading from 1968 to 1973, B.N. Pavan (1973) concluded that there should no longer be concern that placing children in nongraded programs will be detrimental to their academic achievement. In general, nongraded groups perform as well as, and often better than, graded groups on tests designed for graded schools. (p. 312)

Martin and Pavan listed many studies which they claimed supported their conclusion.

The literature did not appear to include a direct statement concerning the facility needs of a nongraded school. However, from the criteria Vogel and Bowers (1974) listed, it can be concluded that provision would need to be made for flexible grouping, for much individual work, and for the use of much instructional media.

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Open Education

The term "open education" has sometimes been confused with "open space" or "open area". However, while the latter two terms have referred to facilities and design, "open education" was used to refer more to organizational climate. The term has not been adequately clarified even by its proponents. Spodek, an accepted authority on open education, said,

> We have talked around the concept of open education and provided some examples, but we have not defined it. Perhaps this is because openness, like freedom, cannot be defined absolutely. (quoted in Hearn, Burdin, and Katz, 1972, p. 2)

John Dopyera (1972, in Hearn, Burdin and Katz) suggested the following frame of reference as a possible approach to open education:

1. That open education should be thought of as one of the alternatives, not necessarily the optimum.
2. That open education provided a potential for certain consequences, but did not guarantee them.
3. That there should be an "Open Program Structure Index" (OPSI) by which one could designate the openness of a particular setting.

As an example of the third point, one could ask, "What is the probability that in this setting, a child with a particular interest or need could have that need or interest met by the program?" A measure of probability could be given. But Dopyera did not suggest the mathematical process by which the measure would be obtained and then expressed.

Devaney (1974) tried to refine the concept of open education by suggesting the following qualities:

1. The teacher divided time into small, concentrated periods for

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individual and group help, rather than for class instruction.

2. The teacher acted as a stimulator, advisor, and consultant, rather than as a giver of knowledge.
3. The teacher did not set out "lumps" of content or skills to be mastered. There was little or no pressure to "get through the book."
4. Children could choose (frequently) from among several appealing, alternative kinds of school work--although the teacher might at times assign work to meet a child's need.
5. The teacher conveyed standards expected for each child individually.
6. In guiding learning the teacher considered the child's style of learning, background, and interests as well as ability. Evaluation, too, was individual--on that child's work.
7. The teacher regarded the whole range of experiences of the child as consequential for learning.
8. The teacher made curriculum decisions and developed materials in collaboration with other teachers, the principal, and parents.
9. The teacher provided several activity centers within the classroom (or classrooms). Such centers could include math, science, instructional media, writing, store, painting and clay, shop.
10. Parents were welcome in the school.

Several writers stressed the human, personal bond between teacher and pupil, rather than the mechanics and materials that had at times been associated with openness. Barbara Day (1976) said that open education was a philosophy rather than a set organizational pattern or a particular teaching method. Bernstein (1975) stressed

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rapport, stability and continuity, and said, somewhat poetically,

> Openness is an Attitude
> Openness is Relating
> Openness is Love. (p. 71)

It seemed that most children who experienced open education wished to continue in it. Stiggins (1974) reported that in the Edina schools, where open education was initiated by community request, not only were the six goals set for the program (covering such objectives as student, parent and teacher participation in decision making, and continual growth in the acquisition of skills) being reached during the first year of the program, but 87 percent of the children were to remain, by choice, in the "open" classrooms for the second year.

Martin (1976) summarized much of the research on open education, and reported the following findings:

1. Children directing their own learning achieved as well as in teacher directed lessons.
2. Open classrooms had more expressive, and less destructive behaviors than did traditional classrooms.
3. Heterogeneous grouping of students across ability and age groups seemed to have specific advantages in (a) a positive increase in self-concept, and improved attitudes toward school and schoolwork, and (b) less admission stress--pupils socialized more readily, with a wider range of children.
4. On measures of self-concept and self-esteem, open classroom children surpassed children in traditional classrooms, with a divergence with age and grade level.
5. Open classroom pupils showed a more positive attitude to school and teachers.

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6. Underachieving children (boys in particular) appeared to gain the most benefit from being in open classrooms.
7. There was more creativity among students in open classrooms.
8. Children in open classrooms showed equal or better achievement in all academic areas.
9. Language experience methods produced results equal to, or superior to, basal and other methods of teaching reading; and when teachers allowed opportunity for choice of activities, children produced more writing than when teachers gave specific writing tasks.

One element clearly implied by the literature on open education was that the individualized program of an open classroom placed a great demand on the teacher's time. It seemed to be usual for open schools to have low pupil-teacher ratios (in the vicinity of 10:1) or for teachers to receive considerable help from aides or volunteer helpers (Burdin, in Hearn, Burdin, and Katz, 1972; Patton, 1976; Sobel, 1975).

Apart from the mention of "centers" with resource materials, and facilities for individual work (Devaney, 1974), particular facilities do not seem to be implied for the open classroom. Rather, openness is related to social climate.

Open Space

One of the more revolutionary changes in the design of school facilities resulted from the acceptance, by educators and architects, of a concept dubbed "open space schools." Such school buildings involved "packages of unbroken space containing anywhere from three

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to five regular sized groups of children and their teachers." The concept was designed to provide a flexible environment "which encourages greater interaction between teacher and pupil, and between teacher and teacher" (Education Facilities Laboratories, 1965, p. 3).

The elimination of corridors and internal walls made a large area of flexible space available. At the same time, however, it made it easier for noise to become a problem, and for students to be distracted by what was happening with other groups. Castaldi (1977) suggested students felt less regimented in the open space plan, that the grouping and regrouping of students was facilitated, and that change, experimentation, and innovation were encouraged. However, Castaldi also observed that confusion and a laissez-faire attitude were often present in the schools without walls, and that students roamed from area to area. The noise level in some of the schools he visited, Castaldi said, made the teacher's instruction difficult for all to hear. Castaldi found that students liked the open space, but admitted they found it made concentration difficult. Some teachers reported they felt "liberated" by open space, but others used mobile furniture and screens to simulate the missing walls.

Testa (1975) sought to meet the argument that open space schools were expensive to build, and required more space per pupil than did traditional schools. He said that examples proved open space did not require more area per pupil, and an open plan school need not be any more expensive to build. He suggested there would be savings in that some aspects of open space were less expensive--fewer partitions and windows, and the building usually more compact. In 1969 Reeves had studied factors related to the planning of spaces for

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schools did not use a significantly wider range of teaching behaviors than did those in his control group. Webb (1976) concluded from his study of the effect of the physical facility on the behavior of elementary school pupils, that the disruptive behavior of students was related, at least in part to the type of school facility attended. He claimed that students in open type facilities demonstrated a "statistically significant" tendency to have less disruptive behavior. La Forge (1972), however, from his study of the effect of open space on personality characteristics of students concluded that the open design of a school did not significantly affect students when the total personality of the individual was considered. He did claim, however, that his data indicated that students with experience in open space schools were "more tender-minded and sensitive" in terms of sympathy for the needs of others than were students from traditional classrooms. The Council of Educational Facility Planners, International (1976) suggested that "the open arrangement facilitates student activity, exploration, and interaction." (p. G-2)

Scott (1973) studied teacher knowledge of students as it related to spatial concepts and its affect upon student attitudes toward classroom and school environments. His findings indicated that teachers in open space schools had more information about their students, and that students in open space schools had more desirable attitudes toward school and education. Scott claimed that each time a significant difference was found, it favored the open space schools. Beals (1972), in a study of emotive perception among students in open space and conventional learning environments found that significantly more students in open space schools who had previously

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attended traditional schools, described their open plan schools in such terms as "happy," "helpful," "fair," and "interesting," in comparison with their previous schools. It seemed from Beal's data that the majority of students who had attended both traditional and open plan schools preferred their experience in the open area schools. It is well to consider Pearson's (1975) claim, however, that social life is not something which can be imposed on a school by the provision of particular facilities.

Wise (1970) studied the furniture used in open space schools. He found that teachers were generally in favor of the furniture in their schools, particularly the movable furnishings which allowed the flexible use of space in a variety of ways. An exception was their dissatisfaction with operable walls. Teachers suggested the need for inservice training in the use of the flexible furniture provided, and Wise himself suggested that teachers should be involved in the selection of school furniture.

The Physical Environment

Educational research has given support to the notion that a good physical environment enhances the teaching/learning process. Modern technology made possible a greater control of such factors as lighting, heating, ventilation, and noise to help create such an environment--at a cost. Visual, thermal, and acoustic aspects of the environment will be considered separately.

The Visual Environment

> Reliable research indicates that critical seeing requires expenditure of physical energy. Poor visual conditions, if not actually harmful to the eyes, cause undue straining and tension to see,

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> thereby bringing about fatigue, irritation, and behavior problems. It is of primary importance, then, that school spaces, old and new, be conditioned to provide for visual comfort and efficiency. (Michigan Department of Education, 1975, p. 41)

Schools need to provide a rich visual environment, including adequate brightness and contrast, yet without glare in the general environment, and particular lighting on significant surfaces where visual tasks are carried out. Michigan Department of Education's (1975) School Plant Planning Handbook has given suggested levels of brightness, which agreed in general with levels suggested by Miles A. Tinker on the basis of experiments he had carried out at the University of Minnesota over a period of thirty years (Stein, 1975).

A recent trend was the introduction of windowless classrooms, depending entirely on artificial lighting. In 1963 Chambers investigated the use and acceptance of windowless classrooms by questioning sixty-three elementary students, twenty-four freshmen and twenty-three juniors, and forty-nine graduate students, all of whom had attended classes in windowless rooms. Chambers' findings included:

1. A trend toward the use of fewer windows in classrooms.
2. A ready acceptance of windowless classrooms by almost all the teachers and students who used them.
3. The most favorable features of the windowless classrooms mentioned by teachers and students were the lack of outside distraction, optimum temperature, and ease of concentration.
4. The main objections were the inability to see outside and to gain a knowledge of outside weather conditions.

However, it was generally accepted that, as Michigan's School Plant Planning Handbook says,

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> From the technical point of view, the introduction of daylight into a classroom is not necessary in the provision of an adequate visual environment. From the standpoint of mental health and aesthetics, however, it is desirable that students maintain a visual association with the out-of-doors if possible. (p. 43)

This view is supported by research carried out by the Architectural Research Laboratory at the University of Michigan (University of Michigan, Architectural Research Laboratory, 1965).

Another important aspect of the visual environment is color. Johnson (1962) studied the effects of color on human beings, and made suggestions concerning the use of appropriate colors to create a warm and attractive school environment. The Michigan School Plant Planning Handbook (1975) agreed with Johnson's basic concepts, but had a less complex and more flexible approach:

> In proper combination, color may be of any suitable hue. For areas receiving little sunlight warm colors should be used. These are the yellow, peach and rose tints. To make an area appear cool and produce a quieting effect, the cool colors are used. These are the blues, greens, and greys. Certainly there should be variety of color from area to area as well as variety and interest within the area. Although variety can be obtained without violent contrasts, and brightness ratio principles should not be violated, relatively small areas of darker or brilliant colors may be used to lend interest and variety to the area. (p. 42)

The Thermal Environment

The objective was to keep the internal temperature of the school comfortable, regardless of the outside temperature (Iowa Center for Research in School Administration, 1967). At the same time the air must be circulated in such a way that it remained fresh, and a satisfactory relative humidity maintained.

Some schools had full air-conditioning, but most had only heating equipment, and in summer circulated unheated air. Experiments indicated that there was a fairly broad band of acceptable

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temperatures (and levels of humidity) under which efficient learning could take place. Hankins (1971) did not find any significant difference in the performance of students in classrooms with controlled (optimum thermal and lighting) conditions and those in classrooms with marginal (just within the acceptable range) conditions. Further research was needed to find out if there was any long-term effect related to marginal thermal conditions.

Schools used a variety of fuels and technology to control the thermal environment. In 1963 Palmer made a comparison of costs of electricity, coal and natural gas as heating agents. His findings suggested that coal was cheaper than natural gas, which in turn was cheaper than electricity. Groups planning school buildings should compare current heating costs in their area, he said, when considering the type of heating plant to be used.

Some rather revolutionary possibilities may exist for energy conservation. Small schools could benefit from some of the research being carried out with solar and wind energy (Neill, 1977). One terraset (underground) school built in Reston, Virginia, designed so that one wall had glass panels to allow visual contact with the outside, and to make some use of natural light, expected to have a saving of 80 percent in energy use compared with a conventional school of the same size (American School and University, 1975).

Some schools generated their own power. Morgan (1968) made a survey of such schools, and concluded that only large schools, in areas where utility prices were particularly high, could operate power generating units economically.

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The Auditory Environment

Many learning activities involve oral communication between teacher and pupil, or among pupils. An increased use of audio-visual aids has increased the noise level in schools. It was important, then, that the auditory environment of the school should support the learning process, and not interfere with it. Exterior sound might be controlled by the location of the school on the site, and/or the provision of suitable sound baffles such as exterior walls (Michigan Department of Education, 1975). Castaldi (1977) gave useful tables showing the sound dampening potential of various building materials which could be used as exterior or interior walls.

Interior noises might be controlled by zoning (although the potential for zoning in a small school was limited), acoustically designed ceilings, and operable partitions or mobile screens (The Metropolitan Toronto School Board, 1968). Carpeting had been found to be one of the more effective treatments for instructional areas, and was competitive with other floor finishes in total cost (where the initial cost and maintenance costs were considered over the life of the feature) (Castaldi, 1977). In research comparing the sound absorbing qualities of various floor coverings used in schools, Etheridge (1972) found a significant difference between the sound absorbtion of resilient floor coverings (asphalt, vinyl, and asbestos tile, and cork) and soft floor coverings (acrylic, nylon, and wool carpeting). The difference was significant at the .01 level of confidence. Cork tile was found to be almost as sound absorbant as wool, nylon or acrylic carpet, and wool carpet slightly more sound absorbant than nylon and acrylic carpet, but the differences were

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very small, and were not statistically significant.

In 1968 Paul Phillips had found that carpeting was accepted and preferred by all teachers he surveyed in carpeted schools, and by a majority of the students. He studied fifteen schools. The most favorable features mentioned by students were that noise was kept down, distractions were lessened, and it was easier to sit or lie on, was warm, and helped prevent injuries when someone fell. Their major objection had to do with static electricity. The most favorable features mentioned by teachers were acoustical quality, better behavior of students, comfort to the feet and legs, ease of cleaning, beauty and warmth.

The School Yard

Michigan's School Plant Planning Handbook (1975) recommended providing ten acres, plus one for each one hundred enrolled, for a K-6 school, and twenty acres, plus one for each one hundred enrolled, for a Middle School or Junior High School. These recommended site sizes were larger than many similar listings. Castaldi (1977), for instance, suggested five acres, plus one for each one hundred enrolled, for a K-6 school, and ten to fifteen acres, plus one for each one hundred enrolled, for a Junior High School as reasonable minimum standards. A careful analysis of the space needs of the educational program to be followed in a school should indicate the space needed in the school yard. However, the yard (like the building) should be flexible and adaptable, and particularly in the case of a small school should have provision for meeting expanded future needs.

There was agreement that the school site needed to be carefully

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chosen, planned, and developed (Alaska Department of Education, 1977; Michigan Department of Education, 1975; North Carolina Department of Public Instruction, 1975). Schultze (1966), in a study of school playgrounds in Omaha, found that in suitable weather pupils spent up to 20 percent of their time outside the building, and concluded that the grounds then become an important educational tool and demanded as much planning as any classroom. His study included facilities for organized play, areas for free play, parking facilities for school personnel and visitors, driveways with adequate safety provisions, loading docks and storage decks, as functional needs of the school, quite apart from the need for landscaping and the development of beauty.

Moore (1975, in David and Wright, editors) urged that pupils have some input in the planning of a school yard. He conducted a survey to find what children liked best in a playground, and found that the general favorites were trees, grass, and places for discovery that could be adapted to many kinds of phantasy. Not that children always agreed:

> The "likes" of some children are often the "dislikes" of others. Natural elements such as grass, flowers, and trees are the only universally liked elements. Otherwise all the remaining communal elements are loved and hated in varying proportions. (p. 103)

Moore also noted that when ponds were a feature in a school yard, water was the most frequently noted element in children's drawings. Yet water was rarely provided as a part of a school environment. Obviously there are climatic conditions to consider, but school planners would do well to make use of Moore's methods to learn what children in their community find most attractive and interesting.

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Even a few months of warmer weather when outdoor equipment and school yard resources could be exploited could contribute much to a child's experience. The challenge, Moore said, was to develop a yard that was safe, educationally rich, and irresistably appealing to the child.

Security and Vandalism

As prevention is better than cure both with regard security and vandalism, the planning committee preparing educational specifications for a new school should be aware of basic measures which can be taken to minimize risk. The architect can then be asked to incorporate preventive measures into the school design.

Davis (1971) studied the causes and possible prevention of of vandalism in Texas public Junior High Schools. His findings included the following:

1. Vandalism increased during the four-year period studied (1966-69).
2. There was a relationship between major vandalism and grade level in school, school enrollment, student turnover, school district enrollment, city population, economic level of the community, and the Anglo-American enrollment percentage.
3. Major vandalism occured most often on Saturday night between eight o'clock and midnight.

The Institute for Development of Educational Activities (1974) in its report on vandalism gave as its considered opinion that "oversized" schools were a major factor in increased vandalism. They recommended that to reduce vandalism large schools should be reorganized into smaller units, that work-study programs be encouraged, and that community involvement be fostered.

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Zeisel (in Neill, 1975), of Harvard University's Department of Architecture, in conjunction with the Public Facilities Department of Boston, and Educational Facilities Laboratories made suggestions for designers and school administrators to prevent or diminish damage to schools. The suggestions made included:

Roof Access:

Make access to the roof as difficult as possible by ensuring that there are no footholds on exterior surfaces, that hardware (e.g. lamps) is not placed where it can serve as a foothold, and that climbable plants are located far from walls.

Plan walls that are too high to climb with accessible ladder substitutes, such as a 12-foot piece of lumber.

Do not install permanent custodial ladders between roofs.

Entrances:

Doorways should be designed in such a way that they clearly indicate "stay out" when school is closed. Pull-down or sliding grills can be used to cover transparent doorways.

Large areas of glass at the entrance should be avoided.

Only one door at the entrance needs to be accessible from the outside. Secondary exit doors need not be accessible from the outside.

Astragals (strips of metal covering cracks in doors) should be specified on all doors with panic hardware to prevent anyone from forcing a piece of wire through the edge of the door.

If the community will be using part of the building, specify built-in interior gates to selectively close off parts of the school not in use.

Locate offices and places for informal meetings and activities near entrances and exits.

Rough play areas:

Minimize glass around play areas.

Provide surfaces that will bounce balls back.

Specify equipment that can withstand rough play.

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Install play equipment with care, so it cannot be damaged easily.

Avoid play areas that are not level and have insufficient room around them.

Specify lines on walls and on ground to accommodate all local street games.

Design "hanging out" areas near play areas to minimize damage and litter. For example, plant containers that can be used as trash baskets should be avoided; wall surfaces should be capable of withstanding abuse.

Avoid unnecessary niches (small spaces adjacent to depressed entrances, staircases).

School Walls and Surfaces:

Plan for some smooth, light, symmetrically blocked out wall surfaces in appropriate places to attract graffiti, and specify material that can be easily painted or washed.

Do not remove "legitimate" graffiti, such as basketball foul lines or hockey goal lines during maintenance.

Paint game lines on walls and ground surfaces after consultation with local players.

Repair damages to walls, ceilings and other surfaces as quickly as possible.

Ground Materials:

Specify planting that does not collect litter and is easy to clean (e.g., thornless).

Use resilient bushes instead of stiff, breakable trees near active areas.

Avoid grass or flowers immediately adjacent to narrow paths or parking lots.

Provide real barriers, such as a change in level, between hard surfaces and adjacent grass.

Accept student-made shortcuts. (pp. 30-31)

Zeisel (1976), in association with the American Association of School Administrators and Education Facilities Laboratories in collaboration with City of Boston Public Facilities Department,

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published a more complete, well illustrated booklet entitled Stopping School Property Damage which could be used by groups planning small school facilities.

Team Teaching

The concept of team teaching went much further than the cooperative efforts of teachers in many schools, where mutual help was given from time to time. Team teaching implied a team of two or more teachers with complementary qualifications and talents, who recognized a team leader, and as a team planned and implemented an integrated instructional program for a single group of students. It was typical that individualized work, and groups of varying sizes including large instructional groups, would be cared for by one or more teachers at any given time (Castaldi, 1977).

There was no one, rigid way in which teaching teams functioned. The essentials were generally considered to be the cooperative planning of curriculum contnet and methods of instruction, flexible scheduling and grouping, and mutual evaluation of the program by the entire team. The major objectives of team teaching were, firstly, to maximize the contribution of each teacher by making use of his particular experience and abilities, and, secondly, to maximize the educational benefit to students by helping each to come into contact with the right teacher (or teachers) at the right time, and in optimum circumstances (The Metropolitan Toronto School Board, 1968).

The facility implications, from the above, involved an area where teachers could plan and prepare, large and small

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instructional areas, provision for flexible grouping, and plenty of resources and facilities for individual learning activities.

Relation Between Project Cost and Planning Funds

The literature reveals a curvilinear relationship between the cost of a project and typical fees charged by architects or other consultants. Godfrey (1977), in outlining mean costs related to construction, suggested that typical architectural fees "below which adequate service cannot be expected," (p. 291) varied from 6.7 percent for projects valued at over 10 million dollars, through 9.2 percent for projects valued at $1,000,000 and 10.8 percent for projects valued at $250,000, to 11.7 percent for projects worth $100,000. No lower project values were quoted. The implications of the data were:

1. Architects were not often involved in projects valued at less than $100.000.
2. By extrapolation, the percentage of fees for projects valued at less than $100,000 would rise steeply, placing a relatively heavy burden on a community planning a very small school.

Pre-design planning costs may, or may not be included in the architectural fees. It is likely that the cost of educational consultants will be a separate charge for the community to meet. It is important, then, for a community to reach a clear understanding with architects and other consultants concerning the specific services covered by their fees (Council of Educational Facilities Planning International, 1976, p. L-6). The evidence suggests that communities planning small schools will face relatively heavy pre-design and design planning costs.

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Summary

The purpose of this chapter was to review relevant literature concerning educational specifications, and current trends in curriculum and facilities which could apply to the planning of small schools.

The importance of educational specifications in the pre-design process of school planning was noted, and their preparation and content surveyed. Current trends in curriculum and facilities which could be considered as options by communities planning small schools were also reviewed. The chapter thus provided a basis for the model and its notes which are presented in chapter V.

Chapter III presents the procedures utilized in the study.

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CHAPTER III

PROCEDURES FOR THE STUDY

As stated in chapter I, the purpose of this study was to develop a planning model for the preparation of educational specifications for small schools. It was assumed that through a review of literature and a survey of facilities existing in Michigan small schools, together with the expressed facility desires of the small schools' principals, the basis for such a model could be established.

This chapter describes the procedures used in the development of the model. Particular activities to be described were:

1. The choice of a questionnaire to survey existing facilities in small schools, and to survey principals concerning the facilities they desired for their schools
2. The gathering of the necessary data
3. The tabulation and analysis of the data
4. The development of the model
5. The evaluation of the model.

The Preparation of the Questionnaire

A questionnaire was utilized to study the facilities available in small schools in Michigan, and at the same time survey the desires of the principals of the small schools in relation to facilities. The questionnaire was based on the Evaluation Criteria used by the

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National Study of Secondary School Evaluation (1969), also used by Dolence (1970) in his study of the secondary schools of Arkansas, and later utilized by Velazquez (1977) for his study of secondary schools in Peuto Rico.

In the preparation of the questionnaire for this study the financial aspect of the earlier instruments was eliminated. The form of the questionnaire used in the survey is attached to the report as appendix A.

The questionnaire had four major elements. The first asked principals to indicate whether or not particular features described existed at their schools. The second asked principals to indicate the value they placed on the facilities described, using the three descriptors "unnecessary," "helpful," and "very important." The third element gave opportunity for the principals to say what activities (if any) they thought were very desirable, but were made difficult by deficiencies in the facilities available to them, and further, what facilities they would most like to see added to their schools. The fourth element asked for basic data concerning each school, such as the number of teachers, enrollment, and the approximate age of the buildings.

The Gathering of Data

The questionnaire was sent to the principal of every elementary school (or elementary school with a capping of middle school classes) listed in the Michigan Education Directory and Buyer's Guide 1977-1978, as having at least four grade levels, but no more than 120 pupils in the case of K-6 schools, or 150 pupils if junior

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secondary grades were included. No schools listed as special educational or vocational schools were included. Additional information regarding enrollments and addresses for Seventh-day Adventist schools in Michigan was obtained from the Lake Union Conference of Seventh-day Adventists 1977-78 Directory (for the Michigan Conference).

The Population of schools used in the survey, then, was all the small schools listed in the Michigan Education Directory and Buyer's Guide 1977-1978, or in the Michigan Conference of Seventh-day Adventists, having at least four grade levels, and an enrollment of no more than 120 for K-6 schools, or 150 for K-10 schools. It should be pointed out that while all schools so listed were included in the survey, there were certainly other small schools in Michigan which satisfied the limits set for this study, but which were not clearly listed (for example, many private schools did not indicate enrollment figures, and so were not included). Thus, while the survey was sent to all schools in the population of small schools clearly listed, that population must be regarded as representative of, but not including, all small schools in Michigan.

Two hundred and twenty-eight copies of the questionnaire, together with a covering letter, and a stamped, addressed, return envelope, were mailed on January 30, 1978. By the end of March two envelopes had been returned undelivered, a further six returns had come from schools which had combined with other schools, or had so increased in enrollment that they were no longer acceptable within the group of schools being studied. The remaining 179 returns received were acceptable for the study, and became the source of data concerning facilities in existing small schools in Michigan.

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The returns represented five school systems--the public, and four parochial--as shown in table 1.

TABLE 1

RETURNS RECEIVED

School System	Number of Returns	Percentage Received of Questionnaires sent
Public	51	82
Adventist	44	84
Catholic	34	85
Christian	9	69
Lutheran	41	77
Total	179	81

No attempt was made to compare the schools of one system with those of another. Instead, the comparisons were between schools of different sizes, as indicated by the number of full-time teachers on the staff.

Tabulation and Analysis

The returns were grouped according to the number of full-time teachers in the school, as shown in table 2.

TABLE 2

CATEGORIES USED FOR COMPARISONS

Number of Teachers	Number of Schools	Percentage of Total
One	12	6.8
Two	23	12.8
Three	23	12.8
Four	41	22.9
Five	39	21.8
More than five	41	22.9
Total	179	100.0

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A further category, for the sake of comparison, was created from the twenty-four schools stated to be no more than 10 years old. That meant that including the total group as one group, together with the six groupings related to the number of teachers on the staff, and together with the category created from the new schools (i.e. those not more than ten years old), there were eight categories, or groups, which could be used for comparisons.

A table was prepared for each category, presenting three columns of percentages. The first column indicated the percentage of schools in that category in which a particular feature (described in the table) existed. The second column indicated the percentage of principals who ranked that feature as "very important," and the third column indicated the percentage of principals who considered the feature was at least desirable.

A further series of three tables was prepared to collate the information, column by column (one column to each of the three tables). This was done to make comparisons between the categories possible without refering to one table after another.

Tables were also prepared to indicate the desires principals had expressed regarding facilities they would wish to see added to their schools, and to collate the additional information principals had given about their schools. A table was also prepared to summarize the evaluations given by the principals, showing what features were considered very important, or basic, and which were considered desirable for schools of various sizes.

An attempt was made to clarify trends and directions indicated by the data. Progressive changes between the schools of various

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sizes were sought, and an attempt made to designate a school size at which various features would be desirable, or very important, respectively.

Development of the Model

The results of the survey and the analysis of the data received, together with the review of literature, provided the basis for listing typical facility needs for various sizes of small schools in the model. The study of literature, and in particular of the planning handbooks produced by the States of Alaska, Michigan, and North Carolina, provided the basis for the development of the flow chart of activities and decisions used in the model. Particular needs of small schools indicated by the principals in their comments on the questionnaires returned, and ideas gained during visits to small schools were also incorporated into the model.

The model was constructed in such a way as to suggest a flow of activities, decisions and participants in the planning process and the development of educational specifications for a small school. No time element was indicated, but a sequence of events and decisions was clearly suggested.

Evaluation of the Model

The model was submitted to a panel of nine experts, made up as follows: two representing each of three of the systems, namely the public schools (one from a district level and one from the State Department of Education), the Catholic schools, and Seventh-day Adventist schools; one representative for each of the other two systems, namely the Lutheran and the Christian school systems; and

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one additional expert opinion was sought from a Michigan resident considered a national authority on small and rural schools. In the case of the public school and Catholic school systems, the experts were the superintendents of those districts with the largest number of schools represented in the survey.

The panel of experts is listed in appendix B. The tabulation and analysis of data are reported in chapter IV.

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CHAPTER IV

ANALYSIS OF THE DATA ON SMALL SCHOOL FACILITIES

The purpose of this chapter was to analyze the data gathered regarding facilities in small schools. The data related both to what existed in the schools surveyed, and to what principals of the small schools considered to be essential and/or desirable for their schools. No attempt was made to evaluate the differing educational programs in the schools surveyed, but the evaluations principals gave concerning facilities available to them were analyzed.

Many principals accepted the invitation to add whatever comments they wished on the questionnaires. Some additions were exclamations of delight, like the comment on one form alonside item 2(a), relating to carpeting in most of the school. It read, "As of yesterday!" But another comment alongside the same item on another questionnaire form read, "And is hard to clean and time consuming!" One principal commented of operable walls that they were "only a gimmick!" and another, alongside the item regarding outdoor classrooms wrote, "In this climate? You're joking!" A school with no copying machine was "looking into getting one this year." The principal of a one-teacher school wrote beside the question regarding teacher-aides, "Oh how I wish for an aide!!!" The principal of an almost new school wrote, "Very little planning went into this school."

Not all principals felt small schools could be viable

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educational units. One wrote that the only way to improve small schools was to "close small schools with less than eight staff members." On the other hand, a principal whose small school was temporarily housed in what had been a government trailer, commented, "It is meeting the needs," and sent some pictures showing an enthusiastic and active school family. Another school mentioned, it would seem with some pride, that their school had progressed from a small temporary building into a fine new facility, enjoying good community support. That same principal told of an innovative plan for providing teacher-aides. Mothers who served as aides were allowed credit toward tuition charges; the school had eighteen such aides.

Several principals commented on the way they shared facilities in other schools or community buildings. Several schools made use of physical education facilities in neighbouring schools, traveling there by bus. At least two small schools joined larger schools nearby for hot lunches. One school made use of a kitchen in a nearby building for senior girls to practice home economics.

The following tables will outline the data gathered by the questionnaire. The returns were divided into six categories according to the number of full-time teachers (one-, two-, three-, four-, five— teacher schools, and schools with more than five teachers). An additional category was also created by combining the returns of schools from all categories which were no more than ten years old. An additional tabulation was also made of the total schools (179) responding to the survey.

The data from each category were outlined in separate tables, and particular features pointed out. Tables were also prepared which

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collated elements from the initial tables so that comparisons across the categories could more easily be made.

Tables 3-10

In each of the tables the first column shows the percentage of respondents who indicated the particular feature existed in their schools. At times a respondent may have left an item completely unmarked. In that event, the percentage shown related not to the total number of returns in the category, but to the returns in which that item had been checked in some way. Only a small number of items were left blank. Minor exceptions were items 2 and 5, where a number of respondents who indicated in section (a) that the school was carpeted, or that there was an office, did not check section (b) at all.

Item 8, regarding ease of access for handicapped students drew considerable written comment. Many who checked to indicate that ramps and wide doors were "unnecessary," qualified their evaluation by writing in "at present." A number of respondents pointed out that access for the handicapped was a state requirement. Others checked to indicate that they had wide doors, but crossed out the word "ramp" and commented that their building was at ground level, and had no steps.

Item 14(h), referring to a health care center in which there was first aid equipment and a cot, drew some comment that State regulations forbade teachers giving medical treatment. However, most principals seemed to recognize that what was intended was not a clinic for giving regular and routine treatments which should be given by a school nurse, but a place where a child feeling ill, or

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an accident victim could be made comfortable and given some privacy while awaiting further care. Several principals indicated they used their offices to meet such needs.

The second column in each table shows the percentage of respondents in that category who indicated the feature described was "very important" for a school like theirs. The third column shows the percentage of principals who checked either the "helpful" or the "very important" boxes (i.e., the percentage of those columns added together). The combined measure was considered to indicate the degree to which principals considered a feature was desirable. The difference between that measure (i.e., the percentage in the third column of the tables) and one hundred, represents the percentage of respondents who indicated a feature was "unnecessary."

One-Teacher Schools

Data received from the twelve one-teacher schools in the responding schools are outlined in table 3. The table was reduced in size so that all the information could be given on one page.

The data showed that the majority of one-teacher schools were carpeted. It was significant that 46 percent of the schools were fairly new facilities (i.e., not over ten years old). Few of the schools had a gymnasium/cafeteria, or a separate office, or teacher's bathroom/toilet. Principals did not, in general, rate such items as "very important," although most indicated they were desirable features. However, in the case of a separate bathroom/toilet for the teacher, 75 percent of the respondents rated it as "unnecessary" for a one-teacher school.

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TABLE 3

PERCENTAGES FOR ONE-TEACHER SCHOOLS
(N=12)

Features	Exists in School	Principal's Evaluation: Very Important	Principal's Evaluation: Helpful and Very Important
1. The building is fully air-conditioned	0	0	10
2. The school is carpeted:			
(a) in most of the school	70	33	89
(b) in a small part of the school	0	0	83
3. The school has a kitchen (or kitchenette)	42	0	72
4. There is a gymnasium/cafeteria area	17	33	86
5. There is provision for administration:			
(a) a separate office	25	25	75
(b) some facilities inside the classroom	33	38	75
6. There is a telephone for the school	92	75	100
7. There is a separate teachers' bathroom/toilet	8	0	25
8. There is a ramp and wide doors for the handicapped to use	17	0	64
9. There is a "wet" area where children use water, clay, etc	18	0	100
10. There is adequate storage space for:			
(a) school supplies	33	100	100
(b) teachers' use	33	83	100
(c) students' use	58	83	100
(d) gardening and janitor's supplies	27	67	100
(e) the use of community groups using the school	8	27	55
11. There are audio-visual aids such as:			
(a) a TV receiver	25	0	60
(b) closed circuit TV	0	0	27
(c) an overhead projector	58	10	80
(d) a movie projector	83	30	100
(e) a slide projector	50	30	100
(f) blinds or curtains for darkening a space	92	70	100
(g) a built-in screen	58	9	73
(h) cassette or tape playing equipment	92	60	100
(i) a record player	83	50	100
(j) a copying machine (a dry copier, or ink duplicator)	83	67	100
12. Different arrangements of students in groups, using:			
(a) a space for large group instruction (50 or more)	0	0	36
(b) folding (or sliding) walls	0	0	45
(c) prefabricated wall sections that can be moved	0	0	36
(d) movable students' desks or tables and chairs	91	55	100
(e) movable furniture (book-cases, cupboards, etc.)	75	46	91
(f) throwdown cushions or stackable blocks	17	8	83
(g) a "think pit" or "think tank"	9	17	75
(h) some study carrels for reading and writing	9	17	92
(i) some "wet" carrels with jacks for listening	17	33	92
13. Tables, shelves, space, for creating learning centers	50	55	100
14. Specialized "centers" for:			
(a) library reading	58	36	91
(b) listening and viewing	33	27	91
(c) science	67	9	91
(d) music	67	0	70
(e) art	25	18	91
(f) home economics	9	0	73
(g) craft or shop	17	0	75
(h) health care--first aid equipment and a cot	17	30	90
16. Indoor gardens or pot plants	58	50	100
17. Facilities for classroom pets like birds, fish, etc.	50	42	92
18. A school yard with features such as:			
(a) an outdoor classroom area	25	8	67
(b) playground equipment	92	75	91
(c) a natural play area with grass and trees	100	83	100
(d) a surfaced area (concrete or asphalt)	50	25	83
(e) an area where the children grow gardens	25	17	92

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Returns indicated a lack of storage area in most schools, even though a high proportion of the schools were relatively new, and though principals indicated clearly by their evaluations that they considered the provision of adequate storage an important feature. The exception was storage for community groups' use, a feature evidently not seen as very important. It seemed possible that one-teacher school facilities did not attract much community use.

The data showed that one-teacher schools were quite well supplied with audio-visual aids, but in general these were not seen as "very important." Blinds or curtains for darkening an area, cassette or tape players, record players, and copying machines were rated as the most important of the aids, although a number of others were also considered desirable.

It was not surprising that one-teacher schools did not have large group areas (item 12[a]). It was more surprising that so few had carrels. It might be that in a one-teacher school it was possible for pupils to obtain the relative privacy needed for individual work using movable desks and other furniture, as both features were in most schools, and considered desirable. The majority of the principals rated facilities for creating centers to be "very important," but only half of the schools had the facilities needed. One-teacher schools appeared to place a value on the growing of indoor gardens and pot plants, and on facilities for pets.

Two-Teacher Schools

Data received from the twenty-three two teacher schools in the responding schools have been outlined in table 4. The table was

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reduced in size to allow it to be displayed on one page.

One school in the category was indicated as having full air-conditioning. This was the only air-conditioned school in the 179 schools for which returns were received. As with the one-teacher schools, the majority of the schools in this grouping were carpeted. The majority of these schools also had a kitchen or kitchenette (but only 32 percent of the principals rated the feature as "very important"). A higher percentage (in comparison with one-teacher schools) had facilities for administration, either as a separate office, or in the classroom. Although a separate bathroom/toilet for teachers was still not rated as "very important" by the majority of the principals, two-thirds did indicate that they considered it a desirable feature.

Storage space was again a feature where the provision made in the schools did not match the evaluation of the facility given by the principals. Most schools had storage space for school supplies, but lacked adequate storage for other items listed. As in the case of one-teacher schools, storage for community groups to use was not rated as "very important" by most principals--but the majority did consider it a desirable feature.

Although a two-teacher school would be unlikely to have an enrollment of more than fifty pupils, 30 percent were said to have large group areas which could hold over fifty, and 55 percent of the principals saw the feature as desirable--possibly for community use, or the use of the school with visitors present.

There was more provision for creating centers, and a greater use of some centers indicated (items 13 and 14) than was the case

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TABLE 4

PERCENTAGES FOR TWO-TEACHER SCHOOLS
(N=23)

Features	Exists in School	Principal's Evaluation: Very Important	Principal's Evaluation: Helpful and Very Important
1. The building is fully air-conditioned	4	0	17
2. The school is carpeted:			
(a) in most of the school	61	29	76
(b) in a small part of the school	0	25	37
3. The school has a kitchen (or kitchenette)	70	32	91
4. There is a gymnasium/cafeteria area	32	55	90
5. There is provision for administration:			
(a) a separate office	41	40	90
(b) some facilities inside the classroom	28	23	77
6. There is a telephone for the school	100	100	100
7. There is a separate teachers' bathroom/toilet	13	22	65
8. There is a ramp and wide doors for the handicapped to use	36	10	55
9. There is a "wet" area where children use water, clay, etc	17	14	86
10. There is adequate storage space for:			
(a) school supplies	70	81	100
(b) teachers' use	41	76	100
(c) students' use	41	71	100
(d) gardening and janitor's supplies	41	77	95
(e) the use of community groups using the school	22	29	76
11. There are audio-visual aids such as:			
(a) a TV receiver	26	15	50
(b) closed circuit TV	9	9	33
(c) an overhead projector	83	72	89
(d) a movie projector	87	74	100
(e) a slide projector	78	67	100
(f) blinds or curtains for darkening a space	65	70	100
(g) a built-in screen	38	35	85
(h) cassette or tape playing equipment	87	83	100
(i) a record player	87	84	100
(j) a copying machine (a dry copier, or ink duplicator)	91	90	100
12. Different arrangements of students in groups, using:			
(a) a space for large group instruction (50 or more)	30	14	55
(b) folding (or sliding) walls	17	0	48
(c) prefabricated wall sections that can be moved	4	4	30
(d) movable students' desks or tables and chairs	100	59	100
(e) movable furniture (book-cases, cupboards, etc.)	55	32	83
(f) throwdown cushions or stackable blocks	17	9	50
(g) a "think pit" or "think tank"	9	13	65
(h) some study carrels for reading and writing	26	23	73
(i) some "wet" carrels with jacks for listening	13	23	77
13. Tables, shelves, space, for creating learning centers	61	48	100
14. Specialized 'centers' for:			
(a) library reading	64	55	100
(b) listening and viewing	45	30	95
(c) science	24	28	95
(d) music	19	15	95
(e) art	30	11	89
(f) home economics	10	20	75
(g) craft or shop	15	19	81
(h) health care--first aid equipment and a cot	33	50	100
16. Indoor gardens or pot plants	68	18	96
17. Facilities for classroom pets like birds, fish, etc.	59	9	96
18. A school yard with features such as:			
(a) an outdoor classroom area	23	27	73
(b) playground equipment	95	70	100
(c) a natural play area with grass and trees	95	90	100
(d) a surfaced area (concrete or asphalt)	45	41	82
(e) an area where the children grow gardens	26	24	86

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in one-teacher schools. Principals rated such features as being highly desirable.

Three-Teacher Schools

Data received from twenty-three three-teacher schools in the responding schools are outlined in table 5. This table, also, was reduced in size so that it could be presented complete on one page.

There was a noticeable drop in the percentage of schools with major carpeting, in comparison with the smaller schools. However, more schools reported carpeting in a small part of the school (33 percent), which meant that the majority of the schools had some carpeting. Carpeting was not rated as so important or desirable by the principals of three teacher schools (compared with the ratings of principals in smaller schools). The majority of three-teacher schools had kitchens or kitchenettes, gymnasium/cafeterias, and separate offices, and those features were seen as desirable by most principals. Almost half the schools had separate bathroom/toilets for teachers, but the feature was not rated as "very important" by most principals.

More schools in this category had adequate storage space, and an increased use of the school facilities by community groups was suggested by the increased provision in storage reported for them. Three-teacher schools appeared to be well provided with audio-visual aids. Apart from television, most schools had the aids listed in the questionnaire, and all (including television, but not closed circuit television) were considered desirable by the majority of the principals.

Most of the schools (52 percent) had facilities for large

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TABLE 5

PERCENTAGES FOR THREE-TEACHER SCHOOLS
(N=23)

Features	Exists in School	Principal's Evaluation	
		Very Important	Helpful and Very Important
1. The building is fully air-conditioned	0	0	23
2. The school is carpeted:			
(a) in most of the school	32	9	89
(b) in a small part of the school	33	7	83
3. The school has a kitchen (or kitchenette)	65	28	95
4. There is a gymnasium/cafeteria area	56	65	100
5. There is provision for administration:			
(a) a separate office	77	76	100
(b) some facilities inside the classroom	27	17	67
6. There is a telephone for the school	100	96	100
7. There is a separate teachers' bathroom/toilet	43	27	74
8. There is a ramp and wide doors for the handicapped to use	17	19	62
9. There is a "wet" area where children use water, clay, etc	21	0	91
10. There is adequate storage space for:			
(a) school supplies	35	78	100
(b) teachers' use	56	74	100
(c) students' use	56	60	100
(d) gardening and janitor's supplies	70	65	100
(e) the use of community groups using the school	30	30	78
11. There are audio-visual aids such as:			
(a) a TV receiver	39	13	68
(b) closed circuit TV	0	0	39
(c) an overhead projector	96	41	92
(d) a movie projector	96	68	100
(e) a slide projector	91	50	100
(f) blinds or curtains for darkening a space	96	64	100
(g) a built-in screen	69	41	86
(h) cassette or tape playing equipment	96	73	100
(i) a record player	100	73	100
(j) a copying machine (a dry copier, or ink duplicator)	91	82	100
12. Different arrangements of students in groups, using:			
(a) a space for large group instruction (50 or more)	52	14	88
(b) folding (or sliding) walls	9	0	59
(c) prefabricated wall sections that can be moved	9	0	45
(d) movable students' desks or tables and chairs	96	55	100
(e) movable furniture (book-cases, cupboards, etc.)	68	31	86
(f) throwdown cushions or stackable blocks	38	0	86
(g) a "think pit" or 'think tank"	18	14	59
(h) some study carrels for reading and writing	41	18	91
(i) some "wet" carrels with jacks for listening	29	9	86
13. Tables, shelves, space, for creating learning centers	71	36	100
14. Specialized "centers" for:			
(a) library reading	82	64	100
(b) listening and viewing	64	36	100
(c) science	55	27	95
(d) music	24	23	82
(e) art	32	22	86
(f) home economics	18	15	73
(g) craft or shop	4	5	88
(h) health care--first aid equipment and a cot	50	41	91
16. Indoor gardens or pot plants	77	23	96
17. Facilities for classroom pets like birds, fish, etc.	73	14	100
18. A school yard with features such as:			
(a) an outdoor classroom area	29	24	76
(b) playground equipment	91	77	100
(c) a natural play area with grass and trees	96	59	95
(d) a surfaced area (concrete or asphalt)	77	36	81
(e) an area where the children grow gardens	0	9	71

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groups, though the feature was deemed "very important" by only 14 percent of the principals. An increased use of study carrels in three-teacher schools was indicated. Facilities for creating centers, and centers for library, listening and viewing, and science, were reported for most schools. All centers listed in the questionnaire were considered to be desirable by the principals.

More three-teacher schools (77 percent) had a surfaced area in the playground than did one-teacher schools (50 percent) and two-teacher schools (45 percent). Strangely, however, a lesser percentage of principals (in comparison with two-teacher schools) rated the feature as "very important."

Four-Teacher Schools

Data received from forty-one four-teacher schools among the responding schools are outlined in table 6. The table was reduced in size so that it could all appear on one page.

Only 11 percent of schools in this category were carpeted in a major portion of the school, and only 58 percent of the principals saw such a feature as being desirable; although another 38 percent of the schools had some carpeting, and 78 percent of the principals indicated they believed at least some carpeting in the school was desirable. Most principals considered kitchens, gymnasium/cafeterias, separate offices, and teachers' bathroom/toilets were "very important" for four-teacher schools; and the majority of the schools had such features (i.e., most schools had one or more of the features, though few schools had all).

The supply of adequate storage space almost matched the

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TABLE 6

PERCENTAGES FOR FOUR-TEACHER SCHOOLS
(N=41)

Features	Exists in School	Principal's Evaluation	
		Very Important	Helpful and Very Important
1. The building is fully air-conditioned	0	0	32
2. The school is carpeted:			
(a) in most of the school	11	10	58
(b) in a small part of the school	38	19	78
3. The school has a kitchen (or kitchenette)	76	68	90
4. There is a gymnasium/cafeteria area	56	78	88
5. There is provision for administration:			
(a) a separate office	61	85	95
(b) some facilities inside the classroom	20	14	57
6. There is a telephone for the school	100	98	100
7. There is a separate teachers' bathroom/toilet	59	64	90
8. There is a ramp and wide doors for the handicapped to use	10	18	67
9. There is a "wet" area where children use water, clay, etc	29	26	81
10. There is adequate storage space for:			
(a) school supplies	60	73	100
(b) teachers' use	63	73	100
(c) students' use	58	58	100
(d) gardening and janitor's supplies	47	70	100
(e) the use of community groups using the school	35	38	92
11. There are audio-visual aids such as:			
(a) a TV receiver	56	19	75
(b) closed circuit TV	2	3	36
(c) an overhead projector	100	77	95
(d) a movie projector	100	87	100
(e) a slide projector	83	73	95
(f) blinds or curtains for darkening a space	93	87	100
(g) a built-in screen	55	53	85
(h) cassette or tape playing equipment	100	87	100
(i) a record player	100	87	97
(j) a copying machine (a dry copier, or ink duplicator)	93	89	100
12. Different arrangements of students in groups, using:			
(a) a space for large group instruction (50 or more)	50	25	88
(b) folding (or sliding) walls	25	12	50
(c) prefabricated wall sections that can be moved	2	5	32
(d) movable students' desks or tables and chairs	95	70	100
(e) movable furniture (book-cases, cupboards, etc.)	68	48	88
(f) throwdown cushions or stackable blocks	17	10	72
(g) a "think pit" or "think tank"	10	8	61
(h) some study carrels for reading and writing	25	20	87
(i) some "wet" carrels with jacks for listening	35	26	90
13. Tables, shelves, space, for creating learning centers	60	50	98
14. Specialized "centers" for:			
(a) library reading	78	63	97
(b) listening and viewing	45	45	92
(c) science	25	34	95
(d) music	25	33	92
(e) art	20	26	95
(f) home economics	7	19	73
(g) craft or shop	5	19	74
(h) health care--first aid equipment and a cot	42	56	95
16. Indoor gardens or pot plants	53	13	82
17. Facilities for classroom pets like birds, fish, etc.	53	24	70
18. A school yard with features such as:			
(a) an outdoor classroom area	22	32	73
(b) playground equipment	98	91	100
(c) a natural play area with grass and trees	83	85	100
(d) a surfaced area (concrete or asphalt)	84	64	100
(e) an area where the children grow gardens	10	12	61

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principals' "very important" rating, except in the case of gardening and janitorial storage space. Community storage space was seen as desirable by 92 percent of the principals (the highest such rating for any category of schools), suggesting a wider use of schools of this size by the community.

Audio-visual aids listed (apart from closed circuit television) were available in most of the schools. All schools had overhead projectors, movie projectors, cassette or tape players, and record players. The majority of principals rated the aids as "very important," and in several instances every principal indicated a particular aid was desirable.

There was an increased use of individual study carrels in four-teacher schools, and principals rated the feature as desirable. The use of centers was not as marked as it was in three-teacher schools (for example, 55 percent of three-teacher schools reported science centers, but only 25 percent of four-teacher schools had them). A later table (table 16) indicates that there was an increased probability that three- and four-teacher schools would have separate areas for such activities as science and music, and this seemed to be reflected in a lessened emphasis on centers.

Five-Teacher Schools

The data received from thirty-nine schools in the responding schools are outlined in table 7. The table was reduced in size so that the complete table could appear on one page.

The trend was seen to continue for the larger schools to have carpeting in a part of the school rather than in a major section of

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TABLE 7

PERCENTAGES FOR FIVE-TEACHER SCHOOLS
(N=39)

Features	Exists in School	Principal's Evaluation: Very Important	Principal's Evaluation: Helpful and Very Important
1. The building is fully air-conditioned	0	0	26
2. The school is carpeted:			
(a) in most of the school	35	15	62
(b) in a small part of the school	52	17	83
3. The school has a kitchen (or kitchenette)	90	46	95
4. There is a gymnasium/cafeteria area	74	69	95
5. There is provision for administration:			
(a) a separate office	87	74	95
(b) some facilities inside the classroom	50	6	47
6. There is a telephone for the school	97	95	100
7. There is a separate teachers' bathroom/toilet	66	39	92
8. There is a ramp and wide doors for the handicapped to use	32	19	62
9. There is a "wet" area where children use water, clay, etc	37	18	76
10. There is adequate storage space for:			
(a) school supplies	63	66	100
(b) teachers' use	61	62	100
(c) students' use	63	59	97
(d) gardening and janitor's supplies	61	76	97
(e) the use of community groups using the school	37	39	84
11. There are audio-visual aids such as:			
(a) a TV receiver	34	19	81
(b) closed circuit TV	5	8	46
(c) an overhead projector	95	58	100
(d) a movie projector	97	71	100
(e) a slide projector	87	63	100
(f) blinds or curtains for darkening a space	92	79	100
(g) a built-in screen	74	40	87
(h) cassette or tape playing equipment	97	55	100
(i) a record player	95	66	100
(j) a copying machine (a dry copier, or ink duplicator)	97	92	100
12. Different arrangements of students in groups, using:			
(a) a space for large group instruction (50 or more)	55	29	80
(b) folding (or sliding) walls	13	3	49
(c) prefabricated wall sections that can be moved	8	3	47
(d) movable students' desks or tables and chairs	92	57	97
(e) movable furniture (book-cases, cupboards, etc.)	76	28	87
(f) throwdown cushions or stackable blocks	26	5	70
(g) a 'think pit" or 'think tank"	21	6	66
(h) some study carrels for reading and writing	39	16	81
(i) some "wet" carrels with jacks for listening	29	14	76
13. Tables, shelves, space, for creating learning centers	74	30	95
14. Specialized "centers" for:			
(a) library reading	74	53	100
(b) listening and viewing	50	12	97
(c) science	50	23	94
(d) music	32	20	100
(e) art	26	9	97
(f) home economics	16	6	83
(g) craft or shop	11	6	85
(h) health care--first aid equipment and a cot	63	53	97
16. Indoor gardens or pot plants	61	16	76
17. Facilities for classroom pets like birds, fish, etc.	53	11	69
18. A school yard with features such as:			
(a) an outdoor classroom area	26	19	62
(b) playground equipment	92	65	100
(c) a natural play area with grass and trees	89	65	100
(d) a surfaced area (concrete or asphalt)	74	41	92
(e) an area where the children grow gardens	3	3	65

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the building. Most of the schools (87 percent) had some carpeting, making this category of schools the most carpeted in the sample, but only 35 percent reported carpeting in most of the school. Most five-teacher schools had kitchens, gymnasium/cafeterias, separate offices, and teachers' bathroom/toilets, and over 90 percent of the principals agreed in each case that the feature was desirable.

A higher percentage of five-teacher schools could report adequate storage apace than did the smaller schools--although in the case of storage for community groups the feature was only adequately provided in 37 percent of the schools (84 percent of the principals rated such storage facilities as desirbale). Five-teacher schools in the sample were not quite as well supplied with audio-visual aids as were the four-teacher schools (exceptions were built-in screens, and copying machines) but it was clear that principals valued the features as highly (evidenced by the ratings they gave) as did the principals of schools with fewer teachers.

The trend for centers to be less highly valued seemed to be continued, and in the case of some centers showed a considerable change. Every type of center listed was rated as "very important" by a reduced percentage of principals, when compared with the ratings given for four-teacher schools. Added comments on the questionnaires indicated that some principals favored separate rooms for science, art, music, etc., rather than centers.

Schools with More than Five Teachers

The data received from forty-one of the responding schools, with more than five full-time teachers, are outlined in table 8. The

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TABLE 8

PERCENTAGES FOR SCHOOLS WITH MORE THAN FIVE TEACHERS
(N=41)

Features	Exists in School	Principal's Evaluation: Very Important	Principal's Evaluation: Helpful and Very Important
1. The building is fully air-conditioned	0	0	44
2. The school is carpeted:			
(a) in most of the school	15	15	82
(b) in a small part of the school	56	24	94
3. The school has a kitchen (or kitchenette)	78	68	93
4. There is a gymnasium/cafeteria area	71	85	100
5. There is provision for administration:			
(a) a separate office	85	88	100
(b) some facilities inside the classroom	29	11	53
6. There is a telephone for the school	98	100	100
7. There is a separate teachers' bathroom/toilet	68	63	97
8. There is a ramp and wide doors for the handicapped to use	27	26	72
9. There is a "wet" area where children use water, clay, etc	32	25	88
10. There is adequate storage space for:			
(a) school supplies	56	85	100
(b) teachers' use	66	78	100
(c) students' use	61	69	95
(d) gardening and janitor's supplies	54	82	100
(e) the use of community groups using the school	68	41	82
11. There are audio-visual aids such as:			
(a) a TV receiver	63	12	85
(b) closed circuit TV	7	3	54
(c) an overhead projector	98	68	97
(d) a movie projector	100	85	100
(e) a slide projector	98	82	97
(f) blinds or curtains for darkening a space	100	80	100
(g) a built-in screen	61	46	79
(h) cassette or tape playing equipment	100	87	100
(i) a record player	100	90	100
(j) a copying machine (a dry copier, or ink duplicator)	95	93	100
12. Different arrangements of students in groups, using:			
(a) a space for large group instruction (50 or more)	44	30	80
(b) folding (or sliding) walls	15	9	63
(c) prefabricated wall sections that can be moved	20	13	58
(d) movable students' desks or tables and chairs	100	75	97
(e) movable furniture (book-cases, cupboards, etc.)	71	47	94
(f) throwdown cushions or stackable blocks	41	23	82
(g) a "think pit" or "think tank"	10	8	72
(h) some study carrels for reading and writing	51	23	87
(i) some "wet" carrels with jacks for listening	32	15	87
13. Tables, shelves, space, for creating learning centers	76	58	98
14. Specialized "centers" for:			
(a) library reading	88	56	97
(b) listening and viewing	63	27	97
(c) science	54	29	97
(d) music	48	26	95
(e) art	39	23	97
(f) home economics	20	13	85
(g) craft or shop	24	19	84
(h) health care--first aid equipment and a cot	59	63	92
16. Indoor gardens or pot plants	56	18	87
17. Facilities for classroom pets like birds, fish, etc.	66	10	90
18. A school yard with features such as:			
(a) an outdoor classroom area	24	15	72
(b) playground equipment	98	85	100
(c) a natural play area with grass and trees	93	77	100
(d) a surfaced area (concrete or asphalt)	90	64	100
(e) an area where the children grow gardens	10	12	75

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table was reduced in size so that all the information could be presented on one page.

The trend continued for more schools to have carpeting in a small part of the school (56 percent) rather than in the major part of the building (15 percent). Although the percentage of schools with kitchens, gymnasium/cafeterias, and separate offices was actually smaller than had been the case with four-teacher schools, the difference was not great. The percentage of principals who saw such features as "very important," however, had increased in comparison with the ratings for four-teacher schools. There was a slight increase (using the same comparison) in the percentage of schools with a separate teachers' bathroom/toilet.

The clearest increase as far as provision of storage space was concerned was in relation to community groups. The number of schools reporting adequate storage space for such groups had risen to 68 percent. The implication was that many five-teacher schools, and those larger, are used as community centers.

Most audio-visual aids listed (other than closed circuit television) were available in the schools and, except for television and built-in screens, were rated "very important" by most principals. Large group areas were available in 44 percent of the schools (a reduction in comparison with three- and four-teacher schools). Flexibility for small groups was provided by movable students' desks (100 percent), individual study carrels (51 percent), and activity carrels (32 percent). These percentages were not markedly different from those for the smaller schools, but over-all suggested a trend toward a greater provision for small groups--necessary, possibly, in a

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larger school where groups were not automatically small. There was no indication from the data of the extent of the various features in the schools. For instance, 51 percent of the schools reported they had individual carrels, but some may have had only one or two in the instructional media center, rather than available throughout the school.

All Schools

Data received from all 179 responding schools are outlined in table 9. The table was reduced in size so that it could appear on one page.

This table was provided by way of an overview, and no particular comments were felt to be necessary.

New Schools (0-10 Years)

Data received from twenty-four schools built within the past ten years were outlined in table 10, so that any clear differences between the newer schools and other categories might be noted. The spread of the new school group is shown in table 11 (see p. 105). It seemed from the data that one- and two-teacher schools were being built (or rebuilt) at a faster rate than the larger schools.

Only one of the new schools had complete air-conditioning, and so there was no indication that the introduction of air-conditioning was a trend in new schools. Carpeting, on the other hand, was a feature in all of the new schools. Carpeting was in a major portion of the school in 86 percent of the schools, and in a small part of the school for 14 percent. Gymnasium/cafeterias were only reported as a feature of 39 percent of the new schools, but they were

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TABLE 9

PERCENTAGES FOR ALL SCHOOLS
(N=179)

Features	Exists in School	Principal's Evaluation	
		Very Important	Helpful and Very Important
1. The building is fully air-conditioned	1	0	29
2. The school is carpeted:			
(a) in most of the school	30	15	72
(b) in a small part of the school	41	18	88
3. The school has a kitchen (or kitchenette)	75	50	91
4. There is a gymnasium/cafeteria area	59	70	94
5. There is provision for administration:			
(a) a separate office	69	73	95
(b) some facilities inside the classroom	30	15	60
6. There is a telephone for the school	98	96	100
7. There is a separate teachers' bathroom/toilet	52	45	83
8. There is a ramp and wide doors for the handicapped to use	24	18	65
9. There is a "wet" area where children use water, clay, etc	26	18	84
10. There is adequate storage space for:			
(a) school supplies	56	77	100
(b) teachers' use	60	73	100
(c) students' use	60	64	98
(d) gardening and janitor's supplies	55	74	99
(e) the use of community groups using the school	30	36	82
11. There are audio-visual aids such as:			
(a) a TV receiver	46	15	74
(b) closed circuit TV	5	4	42
(c) an overhead projector	93	62	96
(d) a movie projector	96	75	100
(e) a slide projector	85	66	98
(f) blinds or curtains for darkening a space	91	77	100
(g) a built-in screen	60	42	84
(h) cassette or tape playing equipment	97	75	100
(i) a record player	96	78	99
(j) a copying machine (a dry copier, or ink duplicator)	93	88	100
12. Different arrangements of students in groups, using:			
(a) a space for large group instruction (50 or more)	45	23	76
(b) folding (or sliding) walls	16	6	54
(c) prefabricated wall sections that can be moved	9	5	43
(d) movable students' desks or tables and chairs	96	65	99
(e) movable furniture (book-cases, cupboards, etc.)	69	39	88
(f) throwdown cushions or stackable blocks	28	11	74
(g) a "think pit" or "think tank"	13	9	66
(h) some study carrels for reading and writing	35	20	85
(i) some "wet" carrels with jacks for listening	28	18	84
13. Tables, shelves, space, for creating learning centers	68	45	98
14. Specialized "centers" for:			
(a) library reading	76	57	98
(b) listening and viewing	52	31	96
(c) science	42	28	95
(d) music	32	23	93
(e) art	29	20	94
(f) home economics	14	12	79
(g) craft or shop	12	13	81
(h) health care--first aid equipment and a cot	49	53	94
16. Indoor gardens or pot plants	60	19	86
17. Facilities for classroom pets like birds, fish, etc.	58	15	83
18. A school yard with features such as:			
(a) an outdoor classroom area	24	21	70
(b) playground equipment	95	79	99
(c) a natural play area with grass and trees	91	75	99
(d) a surfaced area (concrete or asphalt)	75	49	93
(e) an area where the children grow gardens	10	12	72

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TABLE 10

PERCENTAGES FOR NEW SCHOOLS (0-10 YEARS)
(N=24)

Features	Exists in School	Principal's Evaluation	
		Very Important	Helpful and Very Important
1. The building is fully air-conditioned	4	0	10
2. The school is carpeted:			
(a) in most of the school	86	35	90
(b) in a small part of the school	14	11	78
3. The school has a kitchen (or kitchenette)	58	33	83
4. There is a gymnasium/cafeteria area	39	67	100
5. There is provision for administration:			
(a) a separate office	70	54	92
(b) some facilities inside the classroom	46	25	75
6. There is a telephone for the school	96	91	100
7. There is a separate teachers' bathroom/toilet	25	25	58
8. There is a ramp and wide doors for the handicapped to use	50	21	67
9. There is a "wet" area where children use water, clay, etc	29	13	87
10. There is adequate storage space for:			
(a) school supplies	58	80	100
(b) teachers' use	54	70	100
(c) students' use	67	70	100
(d) gardening and janitor's supplies	67	85	100
(e) the use of community groups using the school	33	30	65
11. There are audio-visual aids such as:			
(a) a TV receiver	25	13	71
(b) closed circuit TV	4	5	37
(c) an overhead projector	79	39	100
(d) a movie projector	83	65	100
(e) a slide projector	70	45	95
(f) blinds or curtains for darkening a space	83	70	100
(g) a built-in screen	50	17	78
(h) cassette or tape playing equipment	83	78	100
(i) a record player	83	70	100
(j) a copying machine (a dry copier, or ink duplicator)	87	91	100
12. Different arrangements of students in groups, using:			
(a) a space for large group instruction (50 or more)	33	13	61
(b) folding (or sliding) walls	25	0	43
(c) prefabricated wall sections that can be moved	17	4	35
(d) movable students' desks or tables and chairs	96	48	96
(e) movable furniture (book-cases, cupboards, etc.)	67	25	83
(f) throwdown cushions or stackable blocks	8	0	63
(g) a "think pit" or "think tank"	4	4	70
(h) some study carrels for reading and writing	39	17	88
(i) some "wet" carrels with jacks for listening	33	17	87
13. Tables, shelves, space, for creating learning centers	67	43	91
14. Specialized "centers" for:			
(a) library reading	70	48	100
(b) listening and viewing	54	30	91
(c) science	33	21	96
(d) music	46	17	91
(e) art	46	17	96
(f) home economics	13	13	92
(g) craft or shop	17	13	83
(h) health care--first aid equipment and a cot	46	67	100
16. Indoor gardens or pot plants	79	27	91
17. Facilities for classroom pets like birds, fish, etc.	54	13	80
18. A school yard with features such as:			
(a) an outdoor classroom area	8	25	54
(b) playground equipment	83	65	100
(c) a natural play area with grass and trees	96	73	100
(d) a surfaced area (concrete or asphalt)	46	38	88
(e) an area where the children grow gardens	25	30	78

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TABLE 11

NEW SCHOOLS BY CATEGORIES

Number of Teachers	Number of Schools	Percentage of Category
One	5	46
Two	8	35
Three	3	14
Four	1	2
Five	4	10
More than five . . .	3	7
Total . .	24	14

considered "very important" by 67 percent of the principals. Separate bathroom/toilets were only provided in 25 percent of the schools, and only considered "very important" by the same percentage of principals (and only 57 percent suggested the feature was desirable). This may in part be a reflection of the high incidence of schools with one to three teachers (67 percent) in this category. Easy access for the handicapped was provided in 50 percent of the new schools, representing a clear increase in comparison with the older schools.

New schools did not feature adequate storage at a higher rate than did older schools (in fact two schools, less than one year old, reported inadequate storage areas) except in the case of storage facilities for students' use, and then the difference was only marginal. Principals of new schools did not, in general, rate storage as being as important as did principals of the older schools. That suggested that storage facilities may, in fact, have been more adequate in the newer schools, and thus have presented a less pressing need to the principals.

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The data do not suggest that the provision of television receivers (or of closed circuit television) was a feature of more new schools. It appeared that built-in screens were not featured as often in new schools as in the older schools--and neither were they rated as being very important by the principals.

Clear trends in the provision of facilities for grouping and in the provision of centers were not apparent from the data gathered. Some such trends, however, may have been masked to an extent by the high proportion of very small schools. One- and two-teacher schools made up 54 percent of the new school category, but only 19 percent of the total sample. An implication is that some small schools grow.

An outdoor classroom was featured in only one of the new schools. It could be that teachers have found outdoor classrooms impractical in the Michigan climate, or on the other hand it may be that school yard development continues for some time after the completion of a new school building. It was noted that new schools were also not as well supplied with playground equipment as were other categories of schools.

Summary Tables

Table 12 provides a summary of the features which existed in the schools for which returns were received. Information was gathered from each of tables 3-10 (the first column of each table) and collated.

Table 13 summarizes the "very important" ratings which principals gave the various features described. Information given in the second column of each of tables 3-10 was collated.

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TABLE 12

PERCENTAGE OF SCHOOLS IN WHICH FEATURES EXISTED

	Features Described	One-teacher	Two-teacher	Three-teacher	Four-teacher	Five-teacher	Over five teachers	Total	New schools
1.	The building is fully air-conditioned	0	4	0	0	0	0	1	4
2.	The school is carpeted:								
	(a) in most of the school	70	61	32	11	35	15	30	86
	(b) in a small part of the school	0	0	33	38	52	56	41	14
3.	The school has a kitchen (or kitchenette)	42	70	65	76	90	78	75	58
4.	There is a gymnasium/cafeteria area	17	32	56	56	74	71	59	39
5.	There is provision for administration:								
	(a) a separate office	25	41	77	61	87	85	69	70
	(b) some facilities inside the classroom	33	28	27	20	50	29	30	46
6.	There is a telephone for the school	92	100	100	100	97	98	98	96
7.	There is a separate teachers' bathroom/toilet	8	13	43	59	66	68	52	25
8.	There is a ramp and wide doors for the handicapped to use	17	36	17	10	32	27	24	50
9.	There is a "wet" area where children use water, clay, etc	18	17	21	29	37	32	26	29
10.	There is adequate storage space for:								
	(a) school supplies	33	70	35	60	63	56	56	58
	(b) teachers' use	33	41	56	63	61	66	60	54
	(c) students' use	58	41	56	58	63	61	60	67
	(d) gardening and janitor's supplies	27	41	70	47	61	54	55	67
	(e) the use of community groups using the school	8	22	30	35	37	68	30	33
11.	There are audio-visual aids such as:								
	(a) a TV receiver	25	26	39	56	34	63	46	25
	(b) closed circuit TV	0	9	0	2	5	7	5	4
	(c) an overhead projector	58	83	96	100	95	98	93	79
	(d) a movie projector	83	87	96	100	97	100	96	83

	(e) a slide projector	50	78	91	83	87	98	85	70
	(f) blinds or curtains for darkening a space	92	65	96	93	92	100	91	83
	(g) a built-in screen	58	38	69	55	74	61	60	50
	(h) cassette or tape playing equipment	92	87	96	100	97	100	97	83
	(i) a record player	83	87	100	100	95	100	96	83
	(j) a copying machine (a dry copier, or ink duplicator	83	91	91	93	97	95	93	87
12.	Different arrangements of students in groups, using:								
	(a) a space for large group instruction (50 or more)	0	30	52	50	55	44	45	33
	(b) folding (or sliding) walls	0	17	9	25	13	15	16	25
	(c) prefabricated wall sections that can be moved	0	4	9	2	8	20	9	17
	(d) movable students' desks or tables and chairs	91	100	96	95	92	100	96	96
	(e) movable furniture (book-cases, cupboards, etc.)	75	55	68	68	76	71	69	67
	(f) throwdown cushions or stackable blocks	17	17	38	17	26	41	28	8
	(g) a "think pit" or "think tank"	9	9	18	10	21	10	13	4
	(h) some study carrels for reading and writing	9	26	41	25	39	51	35	39
	(i) some "wet" carrels with jacks for listening	17	13	29	35	29	32	28	33
13.	Tables, shelves, space, for creating learning centers	50	61	71	60	74	76	68	67
14.	Specialized "centers" for:								
	(a) library reading	58	64	82	78	74	88	76	70
	(b) listening and viewing	33	45	64	45	50	63	52	54
	(c) science	67	24	55	25	50	54	42	33
	(d) music	67	19	24	25	32	48	32	46
	(e) art	25	30	32	20	26	39	29	46
	(f) home economics	9	10	18	7	16	20	14	13
	(g) craft or shop	17	15	4	5	11	24	12	17
	(h) health care--first aid equipment and a cot	17	33	50	42	63	59	49	46
16.	Indoor gardens or pot plants	58	68	77	53	61	56	60	79
17.	Facilities for classroom pets like birds, fish, etc.	50	59	73	53	53	66	58	54
18.	A school yard with features such as:								
	(a) an outdoor classroom area	25	23	29	22	26	24	24	8
	(b) playground equipment	92	95	91	98	92	98	95	83
	(c) a natural play area with grass and trees	100	95	96	83	89	93	91	96
	(d) a surfaced area (concrete or asphalt)	50	45	77	84	74	90	75	46
	(e) an area where the children grow gardens	25	26	0	10	3	10	10	25

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TABLE 13

PERCENTAGE OF "VERY IMPORTANT" RATINGS GIVEN

	Features Described	One-teacher	Two-teacher	Three-teacher	Four-teacher	Five-teacher	Over five teachers	Total	New schools
1.	The building is fully air-conditioned	0	0	0	0	0	0	0	0
2.	The school is carpeted:								
	(a) in most of the school	33	29	9	10	15	15	15	35
	(b) in a small part of the school	0	25	7	19	17	24	18	11
3.	The school has a kitchen (or kitchenette)	0	32	28	68	46	68	50	33
4.	There is a gymnasium/cafeteria area	33	55	65	78	69	85	70	67
5.	There is provision for administration:								
	(a) a separate office	25	40	76	85	74	88	73	54
	(b) some facilities inside the classroom	38	23	17	14	6	11	15	25
6.	There is a telephone for the school	75	100	96	98	95	100	96	91
7.	There is a separate teachers' bathroom/toilet	0	22	27	64	39	63	45	25
8.	There is a ramp and wide doors for the handicapped to use	0	10	19	18	19	26	18	21
9.	There is a "wet" area where children use water, clay, etc	0	14	0	26	18	25	18	13
10.	There is adequate storage space for:								
	(a) school supplies	100	81	78	73	66	85	77	80
	(b) teachers' use	83	76	74	73	62	78	73	70
	(c) students' use	83	71	60	58	59	69	64	70
	(d) gardening and janitor's supplies	67	77	65	70	76	82	74	85
	(e) the use of community groups using the school	27	29	30	38	39	41	36	30
11.	There are audio-visual aids such as:								
	(a) a TV receiver	0	15	13	19	19	12	15	13
	(b) closed circuit TV	0	9	0	3	8	3	4	5
	(c) an overhead projector	10	72	41	77	58	68	62	39
	(d) a movie projector	30	74	68	87	71	85	75	65

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	(e) a slide projector	30	67	50	73	63	82	66	45
	(f) blinds or curtains for darkening a space	70	70	64	87	79	80	77	70
	(g) a built-in screen	9	35	41	53	40	46	42	17
	(h) cassette or tape playing equipment	60	83	73	87	55	87	75	78
	(i) a record player	50	84	73	87	66	90	78	70
	(j) a copying machine (a dry copier, or ink duplicator	67	90	82	89	92	93	88	91
12.	Different arrangements of students in groups, using:								
	(a) a space for large group instruction (50 or more)	0	14	14	25	29	30	23	13
	(b) folding (or sliding) walls	0	0	0	12	3	9	6	0
	(c) prefabricated wall sections that can be moved	0	4	0	5	3	13	5	4
	(d) movable students' desks or tables and chairs	55	59	55	70	57	75	65	48
	(e) movable furniture (book-cases, cupboards, etc.)	46	32	31	48	28	47	39	25
	(f) throwdown cushions or stackable blocks	8	9	0	10	5	23	11	0
	(g) a "think pit" or "think tank"	17	13	14	8	6	8	9	4
	(h) some study carrels for reading and writing	17	23	18	20	16	23	20	17
	(i) some "wet" carrels with jacks for listening	33	23	9	26	14	15	18	17
13.	Tables, shelves, space, for creating learning centers	55	48	36	50	30	58	45	43
14.	Specialized "centers" for:								
	(a) library reading	36	55	64	63	53	56	57	48
	(b) listening and viewing	27	30	36	45	12	27	31	30
	(c) science	9	28	27	34	23	29	28	21
	(d) music	0	15	23	33	20	26	23	17
	(e) art	18	11	22	26	9	23	20	17
	(f) home economics	0	20	15	19	6	13	12	13
	(g) craft or shop	0	19	5	19	6	19	13	13
	(h) health care--first aid equipment and a cot	30	50	41	56	53	63	53	67
16.	Indoor gardens or pot plants	50	18	23	13	16	18	19	27
17.	Facilities for classroom pets like birds, fish, etc.	42	9	14	24	11	10	15	13
18.	A school yard with features such as:								
	(a) an outdoor classroom area	8	27	24	32	19	15	21	25
	(b) playground equipment	75	70	77	91	65	85	79	65
	(c) a natural play area with grass and trees	83	90	59	85	65	77	75	73
	(d) a surfaced area (concrete or asphalt)	25	41	36	64	41	64	49	38
	(e) an area where the children grow gardens	17	24	9	12	3	12	12	30

Table 14, in a similar way, presents in a convenient form for comparison the information given in the third columns of each of tables 3-10. It is thus a summary of the percentages of principals in the various categories of schools who rated particular features as being desirable for schools like theirs.

Table 15 gathers data from all the returns received from 179 schools, giving the evaluation of the principals whether the facilities they administered aided or hindered the offering of an adequate, flexible, and individualized program. It was assumed that whatever type of educational program each school was offering, an "adequate" program, meeting the perceived needs of the pupils, would be desired. The terms "flexible" and "individualized" were not defined for the principals, but were terms which are usually given a positive value in the educational setting, and it was assumed that principals would, in summary, be giving their evaluation of the adequacy of the facilities provided in their schools for providing the type of educational program they wished to.

It was noted that a higher percentage of principals felt their schools could support an "adequate" program (83 percent for all schools) than a "flexible" one (71 percent) or an "individualized" one (55 percent). In that the individualization of instruction is one of the potential strengths of small schools, this inadequacy is a serious one.

Table 16 presents data given by the principals concerning the ages of their schools. The ages of major buildings were given in 176 of the returns received. The newest school was only a few months old, and the oldest over one hundred years. The median for the sample

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TABLE 14

PERCENTAGE OF DESIRABLE ("VERY IMPORTANT" PLUS "HELPFUL") RATINGS GIVEN

	Features Described	One-teacher	Two-teacher	Three-teacher	Four-teacher	Five-teacher	Over five teachers	Total	New Schools
1.	The building is fully air-conditioned	10	17	23	32	26	44	29	10
2.	The school is carpeted:								
	(a) in most of the school	89	76	89	58	62	82	72	90
	(b) in a small part of the school	83	37	83	78	83	94	68	78
3.	The school has a kitchen (or kitchenette)	72	91	95	90	95	93	91	83
4.	There is a gymnasium/cafeteria area	86	90	100	88	95	100	94	100
5.	There is provision for administration:								
	(a) a separate office	75	90	100	95	95	100	95	92
	(b) some facilities inside the classroom	75	77	67	57	47	53	60	75
6.	There is a telephone for the school	100	100	100	100	100	100	100	100
7.	There is a separate teachers' bathroom/toilet	25	65	74	90	92	97	83	58
8.	There is a ramp and wide doors for the handicapped to use	64	55	62	67	62	72	65	67
9.	There is a "wet" area where children use water, clay, etc	100	86	91	81	76	88	84	87
10.	There is adequate storage space for:								
	(a) school supplies	100	100	100	100	100	100	100	100
	(b) teachers' use	100	100	100	100	100	100	100	100
	(c) students' use	100	100	100	100	97	95	98	100
	(d) gardening and janitor's supplies	100	95	100	100	97	100	99	100
	(e) the use of community groups using the school	55	76	78	92	84	82	82	65
11.	There are audio-visual aids such as:								
	(a) a TV receiver	60	50	68	75	81	85	74	71
	(b) closed circuit TV	27	33	39	36	46	54	42	37
	(c) an overhead projector	80	89	92	95	100	97	96	100
	(d) a movie projector	100	100	100	100	100	100	100	100

	(e) a slide projector	100	100	100	95	100	97	98	95
	(f) blinds or curtains for darkening a space	100	100	100	100	100	100	100	100
	(g) a built-in screen	73	85	86	85	87	79	84	78
	(h) cassette or tape playing equipment	100	100	100	100	100	100	100	100
	(i) a record player	100	100	100	97	100	100	99	100
	(j) a copying machine (a dry copier, or ink duplicator	100	100	100	100	100	100	100	100
12.	Different arrangements of students in groups, using:								
	(a) a space for large group instruction (50 or more)	36	55	88	88	80	80	76	61
	(b) folding (or sliding) walls	45	48	59	50	49	63	54	43
	(c) prefabricated wall sections that can be moved	36	30	45	32	47	58	43	35
	(d) movable students' desks or tables and chairs	100	100	100	100	97	97	99	96
	(e) movable furniture (book-cases, cupboards, etc.)	91	83	86	88	87	94	88	83
	(f) throwdown cushions or stackable blocks	83	50	86	72	70	82	74	63
	(g) a "think pit" or "think tank"	75	65	59	61	66	72	66	70
	(h) some study carrels for reading and writing	92	73	91	87	81	87	85	88
	(i) some "wet" carrels with jacks for listening	92	77	86	90	76	87	84	87
13.	Tables, shelves, space, for creating learning centers	100	100	100	98	95	98	98	91
14.	Specialized "centers" for:								
	(a) library reading	91	100	100	97	100	97	98	100
	(b) listening and viewing	91	95	100	92	97	97	96	91
	(c) science	91	95	95	95	94	97	95	96
	(d) music	70	95	82	92	100	95	93	91
	(e) art	91	89	86	95	97	97	94	96
	(f) home economics	73	75	73	73	83	85	79	92
	(g) craft or shop	75	81	88	74	85	84	81	83
	(h) health care--first aid equipment and a cot	90	100	91	95	97	92	94	100
16.	Indoor gardens or pot plants	100	96	96	82	76	87	86	91
17.	Facilities for classroom pets like birds, fish, etc.	92	96	100	70	69	90	83	80
18.	A school yard with features such as:								
	(a) an outdoor classroom area	67	73	76	73	62	72	70	54
	(b) playground equipment	91	100	100	100	100	100	99	100
	(c) a natural play area with grass and trees	100	100	95	100	100	100	99	100
	(d) a surfaced area (concrete or asphalt)	83	82	81	100	92	100	93	88
	(e) an area where the children grow gardens	92	86	71	61	65	75	72	78

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TABLE 15

PRINCIPALS' EVALUATION THAT FACILITIES AID OR HINDER THE EDUCATIONAL PROGRAM

Program feature	Percentage of schools							
	One-teacher schools	Two-teacher schools	Three-teacher schools	Four-teacher schools	Five-teacher schools	Over five teacher schs.	Total schools	New schools
Aid								
An adequate program	73	86	87	71	92	85	83	86
A flexible program	58	76	73	61	81	72	71	73
An individualized program	64	57	56	46	54	62	55	68
Hinder								
An adequate program	27	14	13	29	8	15	17	14
A flexible program	42	24	27	39	19	28	29	27
An individualized program	36	43	44	54	46	38	45	32

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TABLE 16

APPROXIMATE AGES OF SCHOOL BUILDINGS, SHOWN AS PERCENTAGES OF SCHOOLS (BY SIZES) IN EACH AGE CATEGORY

Age category	Percentage of schools						
	One-teacher schools	Two-teacher schools	Three-teacher schools	Four-teacher schools	Five-teacher schools	Over five teacher schools	Total sample
0 to 10 years	46	35	14	2	10	7	14
11 to 20 years	27	22	38	30	44	39	35
21 to 30 years	18	31	29	44	38	29	34
31 to 40 years		4		10	3	7	5
41 to 50 years	11	4		2	5	10	5
over 50 years		4	19	12		7	7

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fell in the 21-30 year category. It was noticeable from the data that one-, two-, and three-teacher school facilities tended to be newer than did the larger schools. It was also noticeable that 83 percent of the schools had been built in the past thirty years, a period roughly corresponding to the period of increased school building activity since the end of World War II.

Table 17 presents data from item 15 in the questionnaire, indicating the separate rooms for specialized purposes that principals reported in their schools. It was noticeable that from three-teacher schools on to the larger schools, there was a greatly increased incidence of separate, specialized instruction areas, particularly for library (instructional media), and music. Health care centers were also often in separate rooms (in many cases the office). It was noticeable, however, that even in the larger schools, the majority of schools did not have any special rooms for the purposes listed.

Table 18 presents data given by the principals indicating how many of them administered more than one school. All but one of the instances involving the administration of two or more schools by one principal related to public schools. In the case of the private school principal who reported dual school administration, the two schools shared a common campus, and represented different levels (i.e. elementary and secondary). Public school principals, however, often administered schools separated by many miles, and several administered more than two schools. In a number of instances the principal of the small school would also be principal of a larger school in a nearby towns. Such shared administration of small schools may represent a trend, and would clearly influence the facilities

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TABLE 17

SPECIALIZED INSTRUCTION AREAS REPORTED AS SEPARATE ROOMS

Instruction area	One-teacher schools	Two-teacher schools	Three-teacher schools	Four-teacher schools	Five-teacher schools	Over five tch. schools	Total sample
Library		1	5	9	12	17	44
Listening/viewing .			1	1	2	1	5
Science			1		2	3	6
Music			4	8	3	11	26
Art				2	2	4	8
Home economics . .			1		1	1	3
Craft or shop . . .	1					1	2
Health care			2	3	4	8	17

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TABLE 18

NUMBER OF PRINCIPALS ADMINISTERING MORE THAN ONE SCHOOL

Size of school	Number of schools	Percentage of category
One-teacher	0	0
Two-teacher	4	17
Three-teacher	2	9
Four-teacher	16	39
Five-teacher	7	18
Over five teachers	8	20
Total	37	21

TABLE 19

PRINCIPALS' EVALUATION OF SCHOOL DESIGN IN RELATION TO FUTURE NEEDS

Size of school	Percentage of schools designed to meet future needs
One-teacher	75
Two-teacher	62
Three-teacher	48
Four-teacher	78
Five-teacher	61
Over five teachers	80
Total	70

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for administration in a new facility.

Table 19 presents data given by the principals in which they evaluated the design of their schools in relation to possible future expansion and change. The data indicated that three-teacher schools were not, as a group, well designed for future expansion, in that only 48 percent of their principals considered that the school they administered had been designed in such a way as to adapt readily to meet future needs. One-teacher schools and schools with more than five teachers both received much higher ratings from their principals, in that for those groups 80 percent, and 75 percent, respectively, were considered well designed and able to adapt to meet the possible needs of the future.

Table 20 presents data gathered from the written comments in which principals indicated the facilities they would like to see added to their schools if funds were available. The greatest need was expressed for gymnasium/cafeterias. General purpose rooms were the most mentioned feature desired for one-teacher schools, and they were also linked, in several cases, to the need for space to accommodate indoor physical education activities--suggesting that principals of one-teacher schools desired more generalized space than the concept of a gymnasium/cafeteria implied. Instructional media centers (libraries) were the next most desired feature, followed by facilities for storage. Science was the particular subject for which a specialized instructional area was most often desired. It was interesting to compare that desire with the data in Table 14, which indicated that music rooms were much more common than science rooms in schools with separate, specialized instructional areas.

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TABLE 20

FEATURES PRINCIPALS DESIRED FOR THEIR SCHOOLS, IF FUNDS WERE AVAILABLE

Features desired	One-teacher schools	Two-teacher schools	Three-teacher schools	Four-teacher schools	Five-teacher schools	Over five tch. schools	Total	Composite percentages
Gymnasium/Cafeteria	1	5	11	27	16	11	71	22
Instructional media center	1	4	7	11	10	6	39	12
General purpose area	7	1	3	6	3	10	30	9
Storage facilities	2	5	5	2	7	9	31	9
Science area	3	6	3	4	4	4	24	7
Office/Teachers' workroom		2	4	5	1	3	15	5
Art area		2	1	6	2	5	15	5
Music area		2		4	3	6	15	5
Individual carrels	2	2	5	2		2	13	4
Manual and vacational areas	2	1	2	1	6	1	13	4
Centers		2	3	2	2	3	12	4
Listening and viewing area	4	1		5			10	3
Flexible small rooms	1		1		3	4	9	3
Carpeting			2	1	3	2	8	3
Paint, repairs and maintenance		1		4		1	6	2
Kitchen		3			2		5	2
Indoor gardens or greenhouse		3	1				4	1

NOTE: The numbers in each column refer to the number of respondents in that category who mentioned the designated facility feature as one they desired for their school. The composite percentage column indicates the weighting each feature received overall.

Further suggestions made by individual respondents were:

Teachers' lounge
Teachers' toilets
Large group area
New texts
Playground equipment
Office equipment
Area for duplicating
Teaching materials

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It may be that a music room requires less specialized equipment and is therefore easier to provide, but that teachers feel the need of specialized science facilities.

Table 21 presents, in summary form, the evaluations principals gave the various facilities. Where more than 50 percent of the principals in one of the categories used (one-, two-, three-teacher schools, etc.) rated a feature as "very important" that feature was marked as being basic, and necessary in a small school of that type, even though a community could meet only essential requirements because of limited resources. If over 50 percent of the principals in one of the categories rated a feature as either "helpful" or "very important," that feature was marked as being desirable in a school of that type, should resources make its acquisition possible. A partial marking was used to indicate features where 40 to 50 percent of the principals in a category gave the designated rating (i.e., either basic, or desirable ratings as described above).

Summary

The purpose of this chapter was to present and analyze data gathered in a survey of small schools in Michigan. The data yielded information about existing facilities, the evaluation principals of small schools gave to features of their schools, and the needs the principals felt their schools had for additional facilities.

The information gathered provided a basis for recommendations concerning facilities for small schools contained in the notes which accompany the model presented in chapter V.

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TABLE 21

BASIC (B) AND DESIRABLE (D) FACILITIES FOR SMALL SCHOOLS

Features described (An X indicates more than 50 percent of principals rated it so; an / indicates that 40 to 50 percent of principals rated it so)	One-teacher		Two-teacher		Three-teacher		Four-teacher		Five-teacher		Over five teachers	
	B	D	B	D	B	D	B	D	B	D	B	D
1. The building is fully air-conditioned												/
2. The school is carpeted:												
(a) in most of the school		X		X		X		X		X		X
(b) in a small part of the school		X				X		X		X		X
3. The school has a kitchen (or kitchenette)		X		X		X	X	X	/	X	X	X
4. There is a gymnasium/cafeteria area		X	X	X	X	X	X	X	X	X	X	X
5. There is provision for administration:												
(a) a separate office		X	/	X	X	X	X	X	X	X	X	X
(b) some facilities inside the classroom		X		X		X		X		/		X
6. There is a telephone for the school	X	X	X	X	X	X	X	X	X	X	X	X
7. There is a separate teachers' bathroom/toilet				X		X	X	X		X	X	X
8. There is a ramp and wide doors for the handicapped to use		X		X		X		X		X		X
9. There is a "wet" area where children use water, clay, etc		X		X		X		X		X		X
10. There is adequate storage space for:												
(a) school supplies	X	X	X	X	X	X	X	X	X	X	X	X
(b) teachers' use	X	X	X	X	X	X	X	X	X	X	X	X
(c) students' use	X	X	X	X	X	X	X	X	X	X	X	X
(d) gardening and janitor's supplies	X	X	X	X	X	X	X	X	X	X	X	X
(e) the use of community groups using the school		X		X		X		X		X	/	X
11. There are audio-visual aids such as:												
(a) a TV receiver		X		X		X		X		X		X
(b) closed circuit TV										/		X
(c) an overhead projector		X	X	X	/	X	X	X	X	X	X	X
(d) a movie projector		X	X	X	X	X	X	X	X	X	X	X

(e) a slide projector		X	X	X	X	X	X	X	X	X	X	X
(f) blinds or curtains for darkening a space	X	X	X	X	X	X	X	X	X	X	X	X
(g) a built-in screen		X		X	/	X	X	X	/	X	/	X
(h) cassette or tape playing equipment	X	X	X	X	X	X	X	X	X	X	X	X
(i) a record player	/	X	X	X	X	X	X	X	X	X	X	X
(j) a copying machine (a dry copier, or ink duplicator	X	X	X	X	X	X	X	X	X	X	X	X
12. Different arrangements of students in groups, using:												
(a) a space for large group instruction (50 or more)				X		X		X		X		X
(b) folding (or sliding) walls		X				X		X		/		X
(c) prefabricated wall sections that can be moved										/		X
(d) movable students' desks or tables and chairs	X	X	X	X	X	X	X	X	X	X	X	X
(e) movable furniture (book-cases, cupboards, etc.)	/	X		X		X	/	X		X	/	X
(f) throwdown cushions or stackable blocks		X		X		X		X		X		X
(g) a "think pit" or "think tank"		X		X		X		X		X		X
(h) some study carrels for reading and writing		X		X		X		X		X		X
(i) some "wet" carrels with jacks for listening		X		X		X		X		X		X
13. Tables, shelves, space, for creating learning centers	X	X	/	X		X	X	X		X	X	X
14. Specialized "centers" for:												
(a) library reading	/	X	X	X	X	X	X	X	X	X	X	X
(b) listening and viewing		X		X		X	/	X		X		X
(c) science		X		X		X		X		X		X
(d) music		X		X		X		X		X		X
(e) art		X		X		X		X		X		X
(f) home economics		X		X		X		X		X		X
(g) craft or shop		X		X		X		X		X		X
(h) health care--first aid equipment and a cot		X	X	X	/	X	X	X	X	X	X	X
16. Indoor gardens or pot plants	/	X		X		X		X		X		X
17. Facilities for classroom pets like birds, fish, etc.	/	X		X		X		X		X		X
18. A school yard with features such as:												
(a) an outdoor classroom area		X		X		X		X		X		X
(b) playground equipment	X	X	X	X	X	X	X	X	X	X	X	X
(c) a natural play area with grass and trees	X	X	X	X	X	X	X	X	X	X	X	X
(d) a surfaced area (concrete or asphalt)		X	/	X		X	X	X	/	X	X	X
(e) an area where the children grow gardens		X		X		X		X		X		X

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CHAPTER V

A MODEL FOR THE DEVELOPMENT OF EDUCATIONAL SPECIFICATIONS FOR SMALL SCHOOLS

This chapter describes the model developed for this study. The basis for the model is outlined, the process of its validation is explained, and the model, together with its explanatory notes, is presented.

The Basis for the Model

The model was developed on the basis of:

1. Concepts gathered from literature, regarding educational specifications and the needs of small schools
2. Data gathered in a survey of small schools in Michigan
3. Ideas gained from personal contact with educators particularly concerned with facility planning, and/or small schools.

Particular assistance was received from handbooks in school facility planning produced by the Alaska, Michigan, and North Carolina Departments of Education. The flow chart used in the model was particularly based on the handbooks produced by North Carolina's Department of Public Instruction (1964, 1975).

The particular schematic presentation used in the model is closely related to an "activity-on-node" systems approach, as used in critical path analysis (Lang, 1970, chapter 10), but has no time factor built into it. The model developed in this study could just

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as well be followed by a group taking many months to plan their school, or a community wanting to develop educational specifications in just a few weeks.

Validation of the Model

The model, as presented in this chapter, was sent to a panel of jurors for their evaluation and comments. A listing of the jurors who responded with an evaluation and written comments is given in appendix B. The comment sheet sent to the jurors for their convenience is shown in appendix C.

No changes were made to the model on the basis of comments received from the experts. All except one of the panel members endorsed the model as a useful and adequate guide to be used by a community planning a small school. The one juror who expressed a reservation did so because he wished to see a greater emphasis placed on the particular philosophy and objectives a community had for its school. Other jurors felt that emphasis had been given. However, the juror who expressed reservations still commented that "the model would be helpful to small school projects. Greater emphasis to planning would assist communities in avoiding costly errors."

All of the panel members who were connected with school districts or parochial school systems agreed that the model could have helped in the planning of small schools in their areas.

Narrative responses given by panel members, intended either to support or to suggest modifications to the model, were clear in the support they gave. They are quoted in the following paragraphs, but individuals are not identified in order to maintain the privacy

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of the members of the selected panel:

> Excellently written. Brief and concise treatment of elements were a welcome change from usual doctoral rambling.
>
> It is explicit and well structured, yet recognizes and makes provision for flexibility. It rightly recognizes the educational aspirations of the community as the focal point in designing the school facility.
>
> I appreciate the reference to the need of contacting parochial headquarters regarding policy for buildings as well as State authorities. Both are musts.
>
> Provision is built in to account for resources, shared resources, and the use of the facility as a community center. Recognition is given to various instructional/learning approaches and activities. Attention is given to study of project enrollments. AN EXCELLENT RESEARCH PROJECT!
>
> Strengths noted were: 1. Identification of special area needs often times overlooked until too late. 2. Step by step procedure.
>
> It is briefly stated and to the point, easy to follow, comprehensive enough.
>
> Community involvement must, as you say, be used to maximum. Adaptable as a general model.

The only way in which the model could be further validated would be for communities to use it in the developing of educational specifications for small schools. Modifications and additions would no doubt become necessary in the light of such experience.

Presentation of the Model

The model is presented as it was prepared to be sent to the panel of experts who were asked to comment on it. The graphic presentation of the model is followed by notes explaining each of the twelve steps shown in the model. In addition to the notes, guidelines are given as part of the model. The guidelines present important principles intended to guide in the application of the

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model by a community planning a school facility.

The title page used when the model was sent to the jurors, and the Table of Contents also included at that time, have been omitted.

The Model

Planning a new school is a dynamic and challenging process, charged with far-reaching consequences for the whole community, extending even beyond the life of the resulting building. Planning a small school is a particularly challenging task for at least two reasons. First, there is the need to provide, in a limited space, the varied facilities able to support an adequate educational program. Second, there is the distinct possibility that a small school will later have to be expanded to meet growing needs. Yet at the same time, the community planning a small school is unlikely to have funds for an extensive planning program.

It follows that such a community needs a clear, relatively simple planning model that can be followed with a minimum of expert help in the process of developing appropriate educational specifications, which in turn can guide an architect in the design process. Educational specifications outline the program of education planned for pupils who will attend a particular school, list the facilities thought to be necessary for the program described, list other community activities to be accommodated in the building, and consider possible future needs for expansion and change. The development of educational specifications, then, is primarily a pre-design process

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of problem definition, rather than a problem solving process.

This model is designed to provide a simple and clear sequence of activities and decisions which could be followed by a community in preparing educational specifications for a small school. The sequence of steps suggested in the model is not considered to be rigid. It is acknowledged that a local situation may require additional activities and decisions not included, or indicate a change in sequence.

The model can apply equally to public and private schools. Where a private school is being planned for a particular constituency (as in the case of a parochial school being planned mainly to meet the educational needs of a particular congregation), that constituency functions in the same way as a community. Whenever the term "community" is used in the model and accompanying notes, it can be taken to include any "constituency" planning a school. In the same way, terms like "superintendent" and "director" are used interchangeably.

What is presented is a typical flow of activities, based on a study of literature dealing with school planning and with small schools, and a survey of 179 small schools in Michigan. It is anticipated the model will prove of use.

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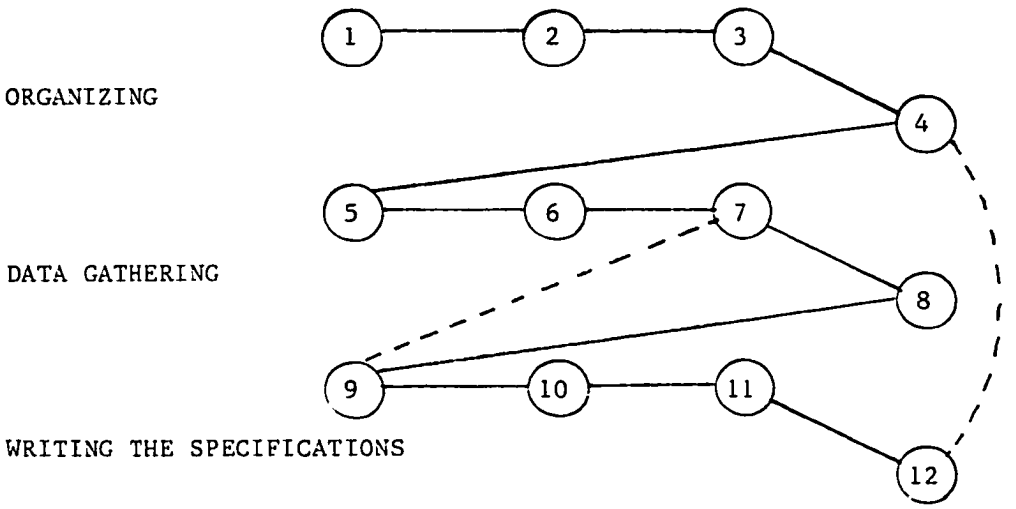
THE MODEL FOR THE DEVELOPMENT OF
EDUCATIONAL SPECIFICATIONS
FOR SMALL SCHOOLS



Steps

1. Decision of Community for need of new school
2. Organization of School Planning Committee
3. Selection of Project Administrator
4. Selection of consultants
5. Statement of educational goals
6. Description of educational program
7. Projection of enrollment
8. Survey of available resources
9. Determination of facility needs for program
10. Suggestion of areas and space relationships
11. Checking of State and school system requirements
12. Writing of educational specifications

Note

The broken lines linking steps 4 and 12, and also 7 and 9, indicate that the activities designated by steps 4 and 7 may continue concurrent with the intervening activities.

Otherwise, the activities follow fairly naturally in the sequence shown, from 1 to 12.

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Notes on the Model

Step 1: Decision of Community for Need of New School

The decision to plan and build a new school must be a community decision if full participation and support is to be achieved. When the need for a new school is felt, community leaders (who may be teachers, parents, or others interested in education) should mobilize public support, and initiate meetings where a planning program can be organized.

If the local community does not initiate a needed planning program, the district superintendent or educational director with responsibility for the area may need to stimulate community action. However, great care will need to be taken lest the community feel it is being coerced, and some resistance result.

Step 2: Organization of School Planning Committee

Under the leadership of respected community leaders, and at a properly conducted public meeting to which all members of the community are invited, the community should elect a school planning committee. The committee should be small, possibly having from five to nine members, with a recognized community leader as chairman. The committee may chose a secretary, or may have the project administrator (see Step 3) serve in that capacity.

The school planning committee will act on behalf of the community to:

(a) Identify the community's educational goals

(b) Describe the educational program the community desires for its school

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(c) Estimate the school enrollment for the immediate and more distant futures

(d) List the resources of the community that will provide the needed financial support for the project. Also list resources that may be shared by the new school, and the possible use of the completed school as a community center

(e) Serve as a focal point for ideas from the community as a whole

(f) Recommend the completed educational specifications for submission to the board of education for their approval

(g) Recommend to the local board of education the retaining of consultants as required, including the architect.

Step 3: Selection of Project Administrator

The school planning committee, in conjunction with the board of education, should obtain the services of a competent project administrator, to serve as an educational expert and guide throughout the planning process. The project administrator may be the superintendent of schools or director of education for the area, or a deputy, or where an existing school is being replaced, the principal of the school. In some circumstances a professional educational consultant may be retained for the planning period to serve as project administrator.

Typical responsibilities of the project administrator will be:

(a) To serve as executive officer and coordinator of the planning program

(b) To serve as catalyst and stimulate the work of the school planning committee, and any sub-committees organized

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(c) To serve as an educational consultant to the groups involved in the planning, explaining State requirements, and educational possibilities

(d) To compile the completed information into educational specifications

The project administrator should be familiar with the process of facility planning, and have access to the Michigan Department of Education's School Plant Planning Handbook, published in 1975.

Step 4: Selection of Consultants

The school planning committee may recommend to the board of education the hiring of expert consultants. Examples are:

(a) Architect

An architect may be recommended by the school planning committee to the local board of education. The selection should be made on the basis of the architect's qualification and experience in relation to school design.

If the architect is selected fairly early in the planning program, he will be able to contribute usefully, and in turn may benefit from insights gained, as a basis for his own design process.

It is expected that the architect is familiar with the Michigan Department of Education's School Plant Planning Handbook, published in 1975, which gives, as well as other useful information, the requirements of the State Health Code, and The Fire Safety Code.

(b) Educational Consultant

In planning a very small school it is quite likely that the project administrator may provide the only educational expertise

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needed. However, there may be circumstances in which the school planning committee requests the board for the services of an educational consultant to give advice in specific areas.

(c) Financial Consultant

A financial consultant may be needed to advise on aspects of the community's financial program in relation to the total planning and building process.

(d) Legal Consultant

As there will be legal contracts to draw up, and the possibility of land to be purchased, bonds to be sold, or loans to be arranged, a legal consultant is certain to be needed.

Step 5: Statement of Educational Goals

With the guidance of the project administrator and input from the community, the school planning committee should prepare a statement of the community's educational goals for the new school.

The project administrator may show the school planning committee goal statements that other groups have prepared. These may be adopted (rarely), or adapted to serve the present community and its school. However, it should be realized that each community is unique, and while a set of goals prepared elsewhere may come very close to representing the present community's hopes for its school, care should be taken to identify the individuality of the community, and express its true aspirations. The more clearly educational goals are expressed, the better the chance that they may be reflected in the educational program planned, and the facilities provided.

There are a number of ways in which the goal statement may be

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prepared for the community, including:

(a) The school planning committee itself prepares the statement

(b) A sub-committee can prepare a statement which the school planning committee will then consider

(c) A community charrette (group discussion) prepares the statement

(d) The Delphi technique of approaching concensus is used.

Step 6: Description of Educational Program

The educational goals of the community become the basis for the educational program planned for a new school. The project administrator will guide the school planning committee in preparing a written description of the planned program, including:

(a) The major instructional/learning approach to be used. Examples are:

Self-contained classrooms

Flexible teaching schedule

Open education

Team teaching

Individualized programs

Nongradedness

(b) The kinds of activities which will be used. Examples are the use of large and small groups, individualized work, activities requiring special centers, or craft tools

(c) The type of flexibility desired in the school. This may be either: (i) unstructured areas (like open space) to be divided as desired, using movable walls, furniture, and screens, or (ii) a selection of spaces of various sizes (either as separate rooms, or partially open to the classroom) which can be used for

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various group and individual activities

(d) Special equipment and facility needs, including the use to be made of educational technology such as visual aids and activity carrels. Special wiring, or other specialized facility needs should be clearly described.

The completed description should be submitted to the local board of education for approval.

Step 7: Projection of Enrollment

The school planning committee, or an appointed sub-committee, with community cooperation, should make a careful survey of the immediate enrollment prospects for the new school.

At the same time the projected enrollment in, say, five years should be calculated, and an attempt made to analyze enrollment trends. These trends, and the probability of future expansion of the school's facilities, will need to be taken into account in preserving the delicate balance to be achieved between the demands of present economy, and the need to provide for easy future expansion.

Clear instructions for calculating projected enrollments are given in:

Castaldi, Basil. Educational Facilities Planning, Remodeling, and Management. Boston: Allyn and Bacon, 1977.

Leggett, Stanton; Brubaker, C. William; Cohodes, Aaron; and Shapiro, Arthur S. Planning Flexible Learning Places. New York: McGraw-Hill Book Co., 1977.

Other books on school planning also suggest ways in which the enrollment projections can be made.

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Step 8: Survey of Available Resources

The school planning committee, or an appointed sub-committee, with the guidance of the project administrator and the help of the community, should survey and list the resources which are available to support both the planning process and the realization of the plans.

Included in the listing should be:

(a) The school site, showing the suitability of the site selected (if one has been) and the availability of alternative sites

(b) Community facilities which the school can share, including buildings (public and private), play areas and equipment

(c) Buildings (including dwellings) available and suitably sited, which could be considered for renovation and remodeling to provide suitable facilities for a small school

(d) Possible community use of the school once it is completed

(e) Government and foundation aid and services available to the new school

(f) Assistance available from commercial and citizen groups in the area

(g) A careful survey of the finances available for the total project. Public school systems should refer to The Michigan School Bond Program, from the Michigan Department of Education, published in 1975.

Step 9: Determination of Facility Needs for Program

The school planning committee, with guidance from the project administrator, will translate the educational program for the new school (see step 6) into facility needs.

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Two lists of facilities follow. The first is a list of those features which the majority of small school principals and educational experts consider are essential if a small school in Michigan is to offer the type of educational program expected by most communities. The second list presents features that are deemed desirable, and should be provided as resources become available.

Basic Facilities

The following features were rated as "very important" by the majority of principals in 179 small schools surveyed in Michigan, and are supported by the literature. It is recognized that local educational goals may alter priorities, and require changes in this listing.

Required for all schools

1. Flexible, general instructional/learning area (classroom)
2. Facilities for administration--filing cabinet, typewriter, and a telephone, at least
3. Storage space for school supplies, teachers' and pupils' items, janitorial and gardening supplies, and the use of community groups which will use the school
4. Audio-visual aids, including a copying machine, cassette or tape playing equipment, headphones, overhead and slide projectors
5. Blinds or curtains for darkening an area
6. Movable pupil stations (desks and chairs, carrels)
7. Equipment and materials for an instructional media center (an expanded library concept)
8. Tables and shelves for creating classroom centers

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9. Either a built-in, or mobile science center (the mobile unit can be used in more than one classroom)
10. Playground equipment, and a natural play area with trees and grass
11. Provision for indoor gardens and pets (such as fish).

Required for two or more teachers

1. A general purpose area for activities such as indoor physical education, large group activities, music and drama (and space for a hot lunch program--when one is introduced)
2. A movie projector and a record player
3. A kitchenette
4. A separate office, used also as a health care center
5. A surfaced section in the playground (cement or asphalt)

Required for four or more teachers

1. A separate room for an instructional media center (library)
2. A kitchen, for home economics, hot lunches, and community use
3. A separate bathroom/toilet for teachers' use
4. A gymnasium/cafeteria, and a hot lunch program.

Desirable Facilities

Other features not rated as "very important" by the majority of the principals of small schools surveyed, but indicated as being desirable by at least two-thirds are listed in ranked order, according to the support they received:

1. Special classroom centers or specialized areas (or in the case

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of larger schools, separate rooms) for listening and viewing, science, art, and music.

2. Some carpeting. Carpeting is now, in fact, an economical floor covering, and should be carefully considered for use in most of the school.
3. Movable furniture which will allow for flexible grouping, and can also double as space dividers.
4. Individual study and activity carrels.
5. A "wet" area where clay, paints, water, etc., can be used without the risk of damaging the school facilities.
6. Craft, or shop, and home economic centers.
7. A television receiver.
8. Cushions and blocks for informal group seating.
9. A garden area, and where possible, an outdoor classroom.

Step 10: Suggestion of Areas and Space Relationships

Once the facility needs have been identified the school planning committee, with the help of the project administrator, should prepare a list of suggested space needs and relationships.

Space needs should be expressed in square feet, and except in the case of specific requirements (such as, say, a ceiling height in a specialized area) should not restrict the architect's creativity by specifying dimensions (i.e., give 150 square feet, and not dimensions like 15' X 10').

Space relationships can be given verbally (e.g., "The rest room facilities should be entered from the entrance lobby, so that they will be accessible from additional classrooms which may be

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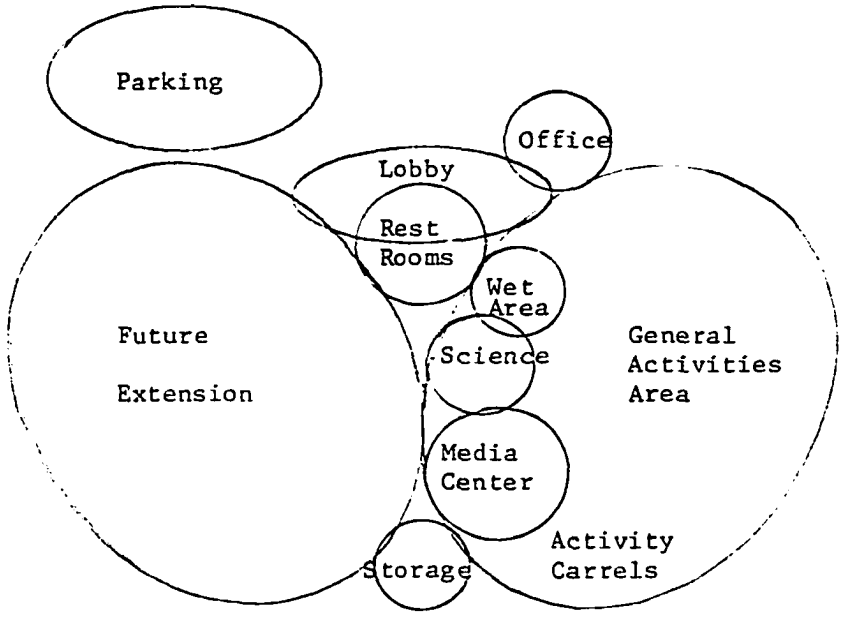
added at a future date ") or graphically, with the aid of bubble diagrams like the following:



Step 11: Checking of State and School System Requirements

Making sure that the school design does not violate requirements of the State Health Code, or the State Fire Safety Code is part of the responsibility of the architect. However, the Project administrator and the school planning committee (preferably in consultation with the architect) should try to make sure that the written educational specifications which are passed on to the architect do not require what is in violation of the codes. A check made before the educational specifications are finally written and approved by the board may obviate later difficulties as the architect creates a design.

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The majority of the small schools in Michigan are a part of one or other of the parochial school systems operating in the State. When a parochial school is being planned the school planning committee should also check with the director of schools for the parochial school system, to find out if there are facility requirements in addition to the State requirements to which the design must conform.

The State requirements for Michigan are summarized in Michigan Department of Education's School Plant Planning Handbook, published in 1975. This publication also outlines the procedure for having plans approved through the school Planning Section, Department of Education, the health department having jurisdiction in various aspects of the design, and the office of the State Fire Marshal, Department of State Police.

Step 12: Writing of Educational Specifications

The project administrator should prepare the educational specifications for approval by the school planning committee, and submission to the district board of education, or the equivalent body in a private or parochial school system.

Once the educational specifications have been approved they will be passed on to the architect.

Suggested headings to be used in the writing of the specifications, and a brief description of content are:

(a) A title page, giving the name of the school, and listing the project administrator and members of the school planning committee

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(b) The Historical Background

- An account of the community's action in initiating the program

(c) The Nature of the School

- The grade levels to be enrolled in the school
- Any particular emphasis, such as religious training

(d) The Community

- A description of the community the school will serve

(e) Projected Enrollments

- Both immediate, and projected long-term enrollments

(f) Educational Goals

- A statement of the community's aspirations for the new school

(g) The Educational Program

- A description of the instruction and learning activities to be housed in the new school--both building and grounds

(h) Educational Trends

- Particular educational features of the planned program, and possible future additions which the design should provide for

(i) Facility Needs

- A description of the spaces and equipment needed to support the planned educational program

(j) Space Requirements

- Square footage recommended for each space
- The total area recommended

(k) Space Relationships

- The relationship of the facility to the site
- The interrelationship of various spaces to each other

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(l) Equipment and Furniture

- A description of the equipment and furniture needed, and for which the design must make allowance

(m) Financial Program

- An estimate of the cost of the completed facility, and the financial program for meeting that cost.

Guidelines

The following are basic principles of small school design, gathered from literature and information given by the principals of 179 small schools surveyed in Michigan. The model given should be applied with these principles in mind.

1. The initial building, whether for one teacher or more, should be designed in such a way as to allow for later additions--these additions to blend in such a way as to provide adaptable and flexible space which forms a viable educational unit.

2. Small schools have an inherent potential for small group and individualized work. Facilities for individual and small group instruction and activities should be incorporated into each classroom area.

3. Small schools cannot provide the specialized areas used for instruction in larger schools. However, semi-specialized areas or "centers" can be provided in general instructional areas. Through the sharing of equipment and other facilities, multiple use of space is possible. Examples are the use of the same sink bench for science, home economics, and for art, and the use of a teacher's office for

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administration, a teacher's work area, and a health care center where a sick child can rest while awaiting transport home.

4. Space should be provided for pupil and teacher use of the aids and materials at their disposal. In a one-room or other very small school, library, audio-visual, science sink, and other special areas must usually be combined in one classroom. The generalized classroom should be designed in such a way that specialization of rooms can be introduced later if desired.

5. A small school's design should incorporate adequate general purpose space for multi use. Such space may be provided in a general classroom or as a separate general purpose area shared by several class groups. Such space must be very flexible to allow for a wide variety of learning activities, such as large group instruction, assemblies, indoor physical education, and drama.

6. The design should provide for an adequate number of proper electrical outlets and other wiring (such as provision for jacks for listening and cable for the possible introduction of closed circuit television) to allow for a future expansion of the use of electronic and other electrical aids.

7. Compactness of design (that is, minimal building perimeter in relation to the building area) will allow for easy movement of pupils from one area to another, and at the same time provide energy economy and lower operation costs. However, some acoustical treatment may be necessary in large open areas.

8. Additional space must be provided for the storage of school supplies, teachers' and pupils' items, gardening and

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janitorial tools and supplies, and storage for materials used by community groups using the school as a community center.

9. The limited, but well planned use of thermal windows will retain a visual link with the outside world, while reducing heat loss and thus making control of the thermal environment more efficient.

10. Because of their size, small schools can benefit from research and technology related to home construction. In suitable areas, units developed for home use that apply wind or solar energy as energy supplements should be carefully considered.

11. Where possible, furniture such as bookcases and work tables should be movable. This will allow space to be restructured as desired. Pupils' desks should be light enough for easy movement, and, if possible, stackable. Combined chair-desk units should not be used.

12. Basic shop and craft equipment should be provided so that pupils can construct and create. A single craft bench and center to each room will serve a very small school, but a separate complex may be more suitable with more than five teachers.

13. Prevention is better than cure with both security and vandalism. A useful reference to help a group planning a school is:

Zeisel, John. Stopping School Property Damage: Design and Administrative Guidelines to Reduce School Vandalism. New York: Educational Facilities Laboratories, 1976.

14. Facilities outside the school building should be conveniently located. The building should be placed on the school site in such a way that future expansion is feasible, and should provide ready

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access to physical education and play areas, parking, and service entrance areas.

15. Emphasis in the outdoor play area should be on developmental physical activity rather than competition. As much natural play area (with trees and grass--preferred by children over surfaced areas) as possible should be provided. Playground equipment could include:

Climbing towers (jungle gym)

Horizontal bars at various heights

Horizontal ladder

Monkey rings (traveling rings)

Climbing poles

Climbing ropes

Slides and swings.

Caution

Facilities and equipment provided for a small school should not over-commit the school and its staff to a particular type of program (such as programmed instruction) with no prospect (apart from expensive changes) of future adaptation to another type of program. Particular caution is called for when an innovative program is being introduced.

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CHAPTER VI

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study was to develop a planning model, or flow chart, which could be used to help communities developing educational specifications as a part of the process of planning a new school. In order to provide a viable basis for the model, literature was reviewed, small schools in Michigan were surveyed, and personal contacts were made with educators particularly concerned with school facility planning and/or small schools.

In the review of literature the development and content of educational specifications, and program and facility options for small schools were studied. Strong support was found for the preparation of educational specifications as a focal objective in the pre-design stage of planning school facilities. The content of educational specifications was found to be flexible, and the general guidelines given by writers like Earthman (1976), Roaden (1963), Steeb (1976), and Streeter (1977), were found to be suitable for the planning of a small school.

Trends in school programs which should be considered as possible alternatives to the traditional, self-contained classroom, were found to include individualized instruction, nongradedness, open education, and team teaching. The facility requirements for each of these options was found to involve flexible space, and

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equally flexible equipment and furniture, to allow for a variety of group activities and individual work.

An analysis of the data gathered from small schools in Michigan yielded information regarding the facilities found in several categories of small schools. Evaluation of the importance of various features of the schools given by the principals, enabled recommendations to be made concerning the facilities planning committees should consider as desirable.

The model developed suggested twelve steps by which a community could develop educational specifications. They were:

1. Decision of Community for need of new school
2. Organization of School Planning Committee
3. Selection of Project Administrator
4. Selection of consultants
5. Statement of educational goals
6. Description of educational program
7. Projection of enrollment
8. Survey of available resources
9. Determination of facility needs for program
10. Suggestion of areas and space relationships
11. Checking of State and school system requirements
12. Writing of educational specifications.

Conclusions

Major conclusions (related to small schools in Michigan) drawn as a result of literature surveyed, information gathered, and

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experience gained during the course of the study were that:

1. Small schools are being designed and built, and there is reason to believe they will continue to provide a needed service in the future.
2. The planning process for a small school is similar to, yet distinct from the planning of larger schools in that particular problems must be met, and distinctive answers sought for them.
3. Restricted funds for the planning process, and the limited availability of professional help are two problems a community planning a small school will possibly face.
4. Small schools have a particular potential for individualized and small group activities. To realize that potential, suitable facilities must be provided.
5. Much of the furniture and equipment provided for a small school should be mobile, so that the flexibility needed in a small school can be achieved.
6. The provision of semi-specialized centers in a small school can largely obviate the disadvantage small schools have in not being able to provide the specialized instruction areas found in larger schools.
7. Small schools have the potential to benefit from research and technology related to home construction, particularly in regard to energy conservation and supplementary sources of energy.
8. Small schools are likely to meet increased needs in the future, requiring extensions to the initial building. It is particularly important, then, that the initial building be adaptable.

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9. Schools with more than three full-time teachers are likely to add more specialized areas, such as an instructional media center, for shared use. In this way the function of some of the centers found in smaller schools is centralized.
10. It is possible to outline a sequence of steps which a community can follow in preparing educational specifications for a small school.

Recommendations

Based upon the findings of this study, the following recommendations are presented for consideration:

1. Similar surveys of small schools should be made in areas other than Michigan, so that regional differences and needs can be analyzed and better understood.
2. The model developed in this study should be field tested by communities planning small schools, and revised in the light of experience.
3. Short training courses should be provided to prepare educators to serve as Project Administrators in the developing of educational specifications for small schools.
4. Particular pre-service and inservice programs should be prepared to help teachers of small schools learn how to care for and use the facilities available to them in a small school setting.

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APPENDIXES

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APPENDIX A

The Questionnaire Used to Survey Facilities in Small Schools in Michigan

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SMALL SCHOOL FACILITIES QUESTIONNAIRE

Directions: Please show by marking the appropriate boxes:
First, in the left-hand boxes, whether the feature described exists at your school. Please understand that the survey covers some small schools offering both elementary and junior secondary classes.
Second, in the right-hand boxes, how important you feel the feature described is for a small school like yours (whether or not you have it at your school).

Is this feature in your school?			How important is it for a small school like yours?		
No	Yes		Unnecessary	Helpful	Very Important
☐	☐	1. The building is fully air-conditioned.	☐	☐	☐
		2. The school is carpeted:			
☐	☐	(a) in most of the school	☐	☐	☐
☐	☐	(b) in a small part of the school.	☐	☐	☐
☐	☐	3. The school has a kitchen (or kitchenette).	☐	☐	☐
☐	☐	4. There is a gymnasium/cafeteria area.	☐	☐	☐
		5. There is provision for administration:			
☐	☐	(a) a separate office	☐	☐	☐
☐	☐	(b) some facilities inside the classroom.	☐	☐	☐
☐	☐	6. There is a telephone for the school.	☐	☐	☐
☐	☐	7. There is a separate teachers' bathroom/toilet.	☐	☐	☐
☐	☐	8. There is a ramp and wide doors for the handicapped to use.	☐	☐	☐
☐	☐	9. There is a "wet" area where children can use water, clay, paints, etc..	☐	☐	☐
		10. There is adequate torage space for:			
☐	☐	(a) school supplies	☐	☐	☐
☐	☐	(b) teachers' use	☐	☐	☐
☐	☐	(c) students' use	☐	☐	☐
☐	☐	(d) gardening and janitor's supplies	☐	☐	☐
☐	☐	(e) the use of community groups using the school.	☐	☐	☐
		11. There are audio-visual aids such as:			
☐	☐	(a) a TV receiver	☐	☐	☐
☐	☐	(b) closed circuit TV	☐	☐	☐
☐	☐	(c) an overhead projector	☐	☐	☐
☐	☐	(d) a movie projector	☐	☐	☐
☐	☐	(e) a still projector	☐	☐	☐
☐	☐	(f) blinds or curtains for darkening a space	☐	☐	☐
☐	☐	(g) a built-in screen	☐	☐	☐
☐	☐	(h) cassette or tape playing equipment	☐	☐	☐
☐	☐	(i) a record player	☐	☐	☐
☐	☐	(j) a copying machine (a dry copier, or ink duplicator).	☐	☐	☐
		12. Different arrangements of students in groups, made possible by:			
☐	☐	(a) a space for large group instruction (50 or more pupils)	☐	☐	☐
☐	☐	(b) folding (or sliding) walls	☐	☐	☐
☐	☐	(c) prefabricated wall sections that can be moved over a weekend	☐	☐	☐
☐	☐	(d) movable students' desks or tables and chairs	☐	☐	☐
☐	☐	(e) movable furniture (book-cases, cupboards, etc.)	☐	☐	☐
☐	☐	(f) throwdown cushions or stackable blocks	☐	☐	☐
☐	☐	(g) a "think pit" or "think tank"	☐	☐	☐
☐	☐	(h) some study carrels for reading and writing	☐	☐	☐
☐	☐	(i) some "wet" carrels with jacks for listening activities.	☐	☐	☐
☐	☐	13. Tables, shelves, and space for creating subject centers and learning centers.	☐	☐	☐

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No	Yes		Unnecessary	Helpful	Very Important
		14. Using the word "center" to mean any small area, or space, designated for a particular use, such as a listening-viewing center, or a science center in part of a general classroom, there are "centers" for:			
☐	☐	(a) library reading	☐	☐	☐
☐	☐	(b) listening and viewing	☐	☐	☐
☐	☐	(c) science	☐	☐	☐
☐	☐	(d) music	☐	☐	☐
☐	☐	(e) art	☐	☐	☐
☐	☐	(f) domestic science	☐	☐	☐
☐	☐	(g) craft or shop.	☐	☐	☐
☐	☐	(h) health care - first aid equipment and a cot.	☐	☐	☐
		15. Please list any of the above (items listed in No. 14) for which you have a separate room in your school.			
		_____			
		_____			
☐	☐	16. Indoor gardens or pot plants.	☐	☐	☐
☐	☐	17. Facilities for classroom pets like birds, fish or hamsters.	☐	☐	☐
		18. A school yard with features such as:			
☐	☐	(a) an outdoor classroom area	☐	☐	☐
☐	☐	(b) playground equipment like swings and slides	☐	☐	☐
☐	☐	(c) a natural play area with grass and trees	☐	☐	☐
☐	☐	(d) a surfaced area (concrete or asphalt)	☐	☐	☐
☐	☐	(e) an area where the children grow gardens.	☐	☐	☐

In summary, do you feel that the facilities in your school aid or hinder you in your effort to provide:

	Hinder	Aid
(a) an adequate program	☐	☐
(b) a flexible program	☐	☐
(c) an individualized program	☐	☐

What type of activities (if any) do you think would be very desirable, but are made difficult by deficiencies in the facilities of your school?

_____

_____

_____

_____

Assuming funds to be available, what facilities would you like to see changed or added to your school to make it more effective as a small school?

_____

_____

_____

_____

How many teachers are there in your school? ☐

How many teacher-aides help in your school? ☐

How many pupils are there in your school? ☐

How many classrooms are there in your school? ☐

How old (approximately) is your school building (in years)? ☐

Which grades are taught in your school? (circle) K 1 2 3 4 5 6 7 8 9 10

Do you administer more than one school? (circle) No Yes

Do you consider that your present school building has been designed in such a way that it can be adapted or extended in appropriate ways to meet possible future needs? (circle) No Yes

Thank you very much for your help.

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APPENDIX B

The Panel of Jurors

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PANEL OF JURORS

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APPENDIX C

The Comment Sheet Sent to the Panel of Jurors

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Response Sheet

After my reading of A Model for the Development of Educational Specifications:

1. I feel that the model, and its notes, are useful and adequate as a planning guide to help a community develop educational specifications for a small school.
   - ☐ Yes
   - ☐ No
   - ☐ Uncertain

2. I feel that the model, had it been followed, would have improved the planning process of small schools in my area.
   - ☐ Yes
   - ☐ No
   - ☐ Uncertain

3. I have noted the following weaknesses in the model and its notes:

_____

_____

_____

_____

_____

4. I have noted the following strengths in the model and its notes:

_____

_____

_____

_____

_____

Signed: _____ Date: _____

Thank you very much for helping.

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APPENDIX D

The Letter Sent with the Questionnaire

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Andrews University Berrien Springs, Michigan 49104 (616) 471-7771

January 30, 1978.

No doubt you will agree with me that the most neglected area in current educational research is the small school. You and I both know that small schools still perform an important service for many thousands of this nation's youth -- and with the right kind of help can do their work well. An important part of that help is providing the most appropriate facilities possible.

My doctoral dissertation is designed to help communities plan effective small schools. I need your help, as an experienced educator in a small school, to help me give the right guidance.

Would you please give a few minutes of your time to complete the enclosed questionnaire. Please feel free to add comments wherever you feel they could be of help. Just slip the completed form into the stamped, addressed envelope and mail it. All responses will be treated as confidential, and no names of schools or principals will be used unless permission has been sought and received.

Your reward? Firstly, the knowledge that you are helping widely separated communities to plan more effective small schools. My study is centered in Michigan, and the model I develop will have usefulness here; but as soon as I have gained my doctorate (in June, if you help me quickly!) I shall return to my home area (Fiji Islands) and use the skills you have helped me gain to plan better schools for developing areas in the South Pacific. Secondly, as at least a token of my appreciation for your help, I will post you an abstract of my completed dissertation.

Thank you very much for your time and help.

Yours sincerely,

Ray Wilkinson
Maplewood Court A-69
Berrien Springs, MI 49103

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APPENDIX E

The Letter Sent with the Model

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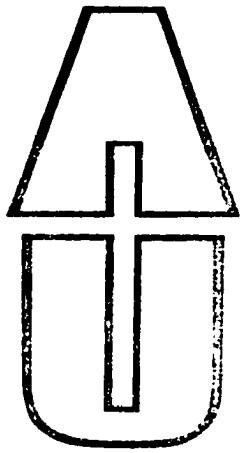

Andrews University Berrien Springs, Michigan 49104 (616) 471-7771

March 28, 1978.

I know you are busy, and will take as little of your time as possible. You have been selected, with nine others, to serve on a panel of experts to evaluate my project -- an important part of my doctoral program. I am counting on your kindness, and your interest in all facets of education, to gain your help. I shall also try to contact you by telephone to ask your help personally.

My home area is the islands of the South Pacific, where because of the scattered population, small schools are typical and essential. In my study, here in the United States, I have tried to develop a planning model (directly related, for this study, to schools in Michigan) that could guide a community wanting to establish a small school, and help in the preparation of useful educational specifications. When I return home in June this year I shall be able to apply many concepts gained in this study to help improve the facilities of our small schools. Facilities do not, of course, decide the quality of education. But they do contribute, and are important.

Would you please take a few minutes to read the attached guidebook, and then respond on the sheet provided. A stamped, addressed envelope is enclosed, so that you can return the response sheet to me.

My project must be completed by the middle of April if I am to graduate in June. If you could help me by responding quickly (in the next day or two, please), I shall be completely grateful.

May you have every happiness and success. The warm glow you feel is from helping me return to the tropics!

Yours sincerely,

Dr E.A. Streeter
Director, Facility Planning Laboratory
Chairman of Doctoral Committee.

Ray Wilkinson
Doctoral Candidate.

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VITA

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Date and Place of Birth: May 27, 1931; Suva, Fiji

Undergraduate and Graduate Schools and Courses:

New Zealand Missionary College, Longburn, New Zealand
Commercial Diploma, 1948
Avondale College, Cooranbong, Australia
Ministerial Diploma, 1950
Theological-Normal Diploma, 1953
Massey University, Palmerston North, New Zealand
Bachelor of Arts, 1968
Diploma in Education, 1976
Andrews University, Berrien Springs, United States of America
Doctor of Education, 1978

Professional Experience:

1954-1955 Principal, Wagga Wagga Adventist School, Australia
1956-1957 Principal, Cook Island Training School, Cook Islands
1958-1959 Principal, Vatuvonu Central School, Fiji
1960-1971 Head of Teacher Education, Fulton College, Fiji
Deputy Principal 1963-1971
Registrar 1964-1968
(Chairman, Tailevu Rural Development Committee 1969-1971)
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Phi Delta Kappa
South Pacific Association of Teacher Educators

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