DOCUMENT RESUME

ED 090 676 88 EA 006 127

AUTHOR McGuffey, Carroll W.
TITLE MEEB: Model for the Evaluation of Educational Buildings.
INSTITUTION Chicago Board of Education, Ill. Dept. of Facilities Planning.
SPONS AGENCY Bureau of Elementary and Secondary Education (DHEW/OE), Washington, D.C.
BUREAU NO 71-7619
PUB DATE 74
GRANT OEG-5-71-0078(290)
NOTE 92p.; Related documents are ED 082 284, ED 083 693, ED 084 659, ED 084 681 and 682, ED 085 833, EA 005 947, and EA 006 123-126

EDRS PRICE MF-$0.75 HC-$4.20 PLUS POSTAGE
DESCRIPTORS *Educational Facilities; Evaluation; Facility Guidelines; Facility Improvement; *Facility Inventory; *Facility Requirements; Models; *Simulation; Standards; *Systems Approach
IDENTIFIERS Elementary Secondary Education Act Title III; ESEA Title III; MEEB; Model for Evaluation of Educational Building; *Simu School

ABSTRACT

This monograph describes the basic conceptual background, the content, and the processes of a systematized approach to the evaluation of educational facilities. The system, the Evaluation of Educational Buildings (MEEB), focuses on a process that compares existing educational buildings in terms of a set of standards, and provides for an analysis in terms of the discrepancies between "what exists" and "what should be." The system incorporates a comprehensive approach with broad application and provides up-to-date information on the condition of facilities as they may affect the general welfare of occupants, and information required for the control of technical and educational obsolescence. It also facilitates the utilization of educational space, aids in maximizing the use of resources allocated to education, and enhances planning and decisionmaking related to the fulfillment of requirements generated by changing educational programs. A selected bibliography is included. (Author/MLF)

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MEEB: MODEL FOR THE EVALUATION OF EDUCATIONAL BUILDINGS

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Project Simu-School: Chicago Component

Funded by:
U.S. Office of Education
ESEA Title III, Section 306
Grant OEG-5-71-0078 (290)
Project 71-7619

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1974

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FOREWORD

Modern-day educational planners face an extremely difficult task of providing quality education to large masses of urban students in view of decreased revenues, soaring costs, shifting populations and changing educational programs. Such a challenge requires that a far greater emphasis be placed on planning for schools than has been the case to date and necessitates the development of improved techniques specially designed for educational planning.

Project Simu-School is intended to provide an action-oriented organizational and functional framework necessary for tackling the problems of modern-day educational planning. It was conceived by a task force of the National Committee on Architecture for Education of the American Institute of Architects, working in conjunction with the Council of Educational Facility Planners. The national project is comprised of a network of component centers located in different parts of the country.

The main objective of the Chicago component is to develop a Center for Urban Educational Planning designed to bring a variety of people--laymen as well as experts--together in a joint effort to plan for new forms of education in their communities. The Center is intended to serve several different functions including research and development, investigation of alternative strategies in actual planning problems, community involvement, and dissemination of project reports.

The importance of a systematic evaluation of educational facilities need hardly be labored; yet there is evidence to suggest that facilities evaluation has generally been intermittent, piecemeal, and, in some cases, virtually nonexistent. The lack of a widely accepted methodology, no doubt, contributes to the current practice. This monograph describes the conceptual and practical aspects of a comprehensive and systematic approach to the evaluation process. The model has been successfully operationalized and use-tested; hence, it should be of considerable interest to educational facility planners throughout the country.

Joseph P. Hannon
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TABLE OF CONTENTS

I

NEED FOR SYSTEMATIC APPRAISAL OF EDUCATIONAL BUILDINGS

Purpose

The purpose of this monograph was to describe an evaluation process designed to measure the adequacy of the environmental factors which affect the functioning of educational facilities in support of the educational program. The overall appraisal system consists of both qualitative and quantitative subsystems. The qualitative subsystem purports to relate facilities components to a definitive set of standards. The qualitative aspects are usually associated with the term evaluation. The quantitative subsystem is an inventory process designed to generate information for estimating school plant capacity. Major emphasis has been given to the presentation of the qualitative subsystem.

This monograph was prepared to describe a qualitative appraisal model which compares the real world of "what exists" with expectation of "what should be". The model was developed to facilitate the tasks of facilities planners, administrators and plant managers of making decisions that will upgrade existing facilities, that will help make more effective use of scarce resources and that will bring the quality of educational facilities in agreement with more widely accepted criteria or standards.

Historical Perspective

The period following World War II generated unprecedented demands on the resources of this nation to fulfill the expectations of a people who

had acquired an abiding faith in mass public education. During that period there was an accelerated growth in the school population and major educational program changes which caused an unexpected boom in school construction.

The boom followed an era during which school building construction had been at an all time low. During the Great Depression money was scarce, thus many school boards had little or no capital outlay funds with which to build schools. Subsequent to the Depression, the nation was in an all-out war effort. Materials and labor were needed for defense purposes, thereby virtually eliminating school construction in the United States.

Following World War II, school construction was delayed until essential materials became available, and building costs returned to reasonable levels. In the meantime, the lag in school construction, rapid increases in school enrollments, population shifts and the extension of educational programs both upward and downward combined to increase the demand for school building space.

Few school systems managed to keep pace with the ever-increasing demand for new and modernized educational facilities. Attention was focused necessarily on providing enough space to house increased enrollments. Unfortunately, the demands created by increasing needs for new space resulted in the neglect of the quality and condition of older buildings. Likewise, the schools extended their services dramatically in response to political and social pressures. This created new and additional demands for more and different types of facilities appropriate to an education required by a rapidly changing social order.

A new era appears to be evolving. This is an era which might be characterized by scarcities of resources, zero population growth, continued

mobility of the population, a decline in the school population, an accelerated rate of technological development, and the need for more complex and varied facilities to support evolving educational programs. Demands for accountability on the part of the public are being incorporated into law. Financial support no longer comes easily leaving education officials with fewer and fewer options for solving educational facilities problems. Many school districts are beset with numerous facilities problems, some of which arise out of the past, others that are due to current social and political pressures and still others that promise to generate new problems for the future if solutions are not found and implemented before they occur.

State-of-the-Art

The need for a systematic approach to facilities evaluation would appear to require little documentation. Yet there is overwhelming evidence to suggest that the evaluation of educational facilities has been intermittent, piecemeal, and, in some cases, nonexistent. The lack of a widely accepted up-to-date methodology, no doubt, contributes to the level of current practice.

Agency Evaluations

State agencies such as school building planning and service departments have incorporated standards for school buildings in their publications. Such standards, however, are intended as guidelines for the planning of new school plants and are not structured usually for evaluation purposes. Those state

agencies which engage in the practice of conducting school plant surveys usually apply building standards for new schools as yardsticks but, the appropriateness of their application to existing buildings and sites varies greatly. A widely held view is that local fiscal conditions and local programs should be considered in determining the expected quality of buildings to be found at the local school district level. The major problem with this view is that these are great inequalities in facilities from school to school in the same district. These differences are the result of applying a double standard - one to new construction and another to existing buildings.

State accrediting agencies engage in a process of evaluation to determine what schools should be accredited and what schools should not. In this process some states have adopted a set of standards, as well as, methods for determining whether schools meet accreditation requirements. Procedures usually involve the publication of an evaluation instrument containing a set of standards and a set of instructions for using the instrument. The instrument in many states is self-administered. Some improvement in safety and health conditions can be documented as a result of this practice. Unfortunately, this process has failed to generate the type of general improvement needed in educational facilities in most states.

Regional accrediting agencies, likewise, promote a process of self-evaluation which includes school buildings. Usually a visiting committee reviews the self-evaluation report prepared by the staff of a school and either agrees or disagrees with the findings of the local staff. Some visiting committees have taken hard stands on the need for improving building conditions when extreme deficiencies were encountered but few cases can be

documented in which major facility improvements have been generated from the use of the criteria and evaluation instruments used. The criteria usually are very broadly stated leaving room for widely varying interpretations in their application.

Evaluations by Survey Specialists

School building survey specialists have made significant contributions to the present state-of-the-art of facilities evaluation. Checklists, rating scales, workbooks, score cards, evaluation forms and appraisal guides have been developed and used over a period of years.

An examination of these instruments will reveal major differences as well as common elements. They all provide for a systematic checking of facilities according to a check list of questions or items accompanied by a statement of criteria or standards. Most provide for the assignment of numerical scores to the items to be checked.

Two approaches have been used. One approach assigns a total score for a perfect school building with specific scores given to each of a hundred or more items included. Sub-scores are assigned to each item by the evaluator and totalled to obtain the total score for a school plant. Another approach begins with a perfect score on each item and assigns penalty points for each shortcoming observed. The score for a particular facility is derived by subtracting the penalty scores from the score assigned as the perfect score for each item.

Most of the available evaluation techniques provide for scoring the physical characteristics of the school plant such as structure, lighting,

heating and so on. Assessing the physical characteristics of a building is an essential part of the evaluation process. Another technique that has been used provides for the assessment of functional aspects such as adequacy, efficiency, expansibility and so on. Before final judgments can be made concerning the extent to which a facility serves its intended purpose, its functional aspects must be evaluated, also.

Existing Techniques Inadequate

It is the position of this writer that neither of the above techniques is sufficient. Both approaches are essential to a complete evaluation of school facilities. If one accepts the premise that a school plant performs a service function for the educational program, then the adequacy of the plant should be judged in terms of the quality of service it will render over its useful life span. This suggests that both technical and educational functions must be considered.

Specific Needs for Systematic Evaluation

Systematic evaluation of educational buildings should be expected to produce the kinds of information that will assist administrators in improving their decisions and thereby, lead to better practice in numerous ways. Selected needs for continuous systematic evaluation of educational facilities are discussed herein.

Protect Welfare of Occupants

A continuous evaluation of educational buildings is in order to maintain up-to-date information on the condition of facilities as they may affect the general welfare of occupants. The major concerns are safety, healthfulness, comfort, personality development and general attitude as they may be influenced by the physical plant.

The school has a particular obligation to provide for the safety of children and youth who are required by law to attend school. The school has no right, morally or legally, to compromise decisions or practices where safety is concerned. A systematic evaluation is essential to detect possible safety hazards and to determine corrective measures required to eliminate them.

Most children and youth attend school during a large part of their conscious day. The school assumes a moral obligation for their care and must accept responsibility for those conditions or influences which may affect their health, physiological or psychological. Such factors as seeing, hearing, ventilation, temperature control, sanitation, aesthetics and external psychological stress conditions are of concern.

Control Obsolescence

The life of a school building is finite. However, buildings, like people, usually grow old gradually.

The process of deterioration sets in as soon as a building is occupied due to use, weather and aging. Gradually, parts of a building wear out,

equipment breaks down or wears out, and maintenance becomes more expensive. Mechanical, plumbing and electrical systems wear out from prolonged use and become inefficient and more expensive to maintain and operate. Eventually, buildings reach a stage of technical obsolescence if maintained in use long enough. This is the stage when electrical, structural, mechanical and other building systems fail to perform in accordance with improved standards of performance found in currently available systems or, they may impair the functioning of processes which the building was designed to facilitate.

Education stays in a state of flux. The magnitude of educational change over the last two decades is measurable only in relative terms. It has been extensive, however. Educational obsolescence, a condition of building design, is one of the most widespread problems on the current educational scene. This condition is due to the dramatic developments in educational technology, changes in methods and curriculum and the lack of adaptability of traditional school building design. No facet of the school program has remained untouched. While the extent of obsolescence may be a matter of degree, buildings ill-suited to current educational practice require careful evaluation to assess their adaptability to more effective educational performance.

Systematic evaluation is an essential process if management is to control the technical and educational obsolescence of existing buildings.

Improve Utilization Efficiency

Utilization efficiency refers to the extent to which use demands of

the educational program match available spaces. For maximum efficiency, available space should fit use demands. Problems encountered are overcrowding, curtailed enrollments in a subject area, vacant rooms and underutilization of space, imbalances between subject enrollments and available space, or the absence of space for a specific curriculum area. A continuing analysis is needed to determine whether or not building use can be improved by better management or whether building alterations are needed to accomplish better program fit. Systematic evaluation can facilitate this process.

Eliminate Waste

Waste can occur in many ways. Waste in educational buildings occurs when too many resources are used to accomplish a specific educational objective or when an educational objective is not attained because resources were improperly used. The continued use of a greatly underutilized building resulting in high unit costs of maintenance and operation is an example of unnecessary waste. On the other hand, a building may be economical to operate but fall short of fulfilling current educational requirements. In either case, assessment may reveal that the ratio of resource input to educational output is out of line with normative practice elsewhere in the school system. Systematic evaluation should facilitate decision-making in this regard.

Increase Educational Adequacy

An educational building is a means of facilitating the implementation

of educational processes. The adequacy of an educational building should be measured in terms of the quality of the service it renders in support of the educational program over its useful life. Changing educational needs will require concomitant building changes. Current, as well as, future program requirements should be of concern. The introduction of new curricula, changes in pupil-teacher ratios, changes in staff utilization, and program extensions both vertically and horizontally, will affect the educational adequacy of the building. Grade organization changes, and increases or declines in enrollments are factors to be considered, also.

The use of a continuous and systematic evaluation system can contribute substantially to decision-making relating to these problems.

Planning and Decision Making

Evaluation is an essential element in the process of management. It is used in the process of planning to assist in the assessment of needs. Without evaluation, decision-making has little basis for differentiating among alternative strategies and courses of action. A systematic process of evaluation that contributes to planning and decision-making in the administration and management of educational buildings is of equal importance to that of any other phase of the educational program.

The Contents

Chapter I has attempted to lay the groundwork for this monograph and to justify the need for a systems evaluation process that is comprehensive.

Chapter II provides a general description of a proposed facilities evaluation system. The Chapters III, IV, and V describe the major components of the evaluation system. The Summary and Conclusions are presented in Chapter VI.

II

DESCRIPTION OF THE MODEL

Introduction

The model presented in this monograph has been developed in response to the need for an approach that will provide a more comprehensive and systematic method for the evaluation of educational buildings. Various and sundry types of rating scales, score cards and check lists have been used by the writer over several years of activity in evaluating educational buildings for a wide variety of purposes. Attempts to devise new techniques to serve different purposes led to the development of a component or modular approach allowing the use of one or all of the modules of the system depending upon the ultimate use to be made of the information or data generated by the evaluation process.

Rationale of the System

An evaluation system must fulfill certain requirements if it is to be useful and effective. Basic assumptions about the nature of evaluation and the purposes it should serve must be understood. A set of guidelines are presented here that were considered to be fundamental to the system and that have provided direction in the development of it.

Guideline 1

A fundamental purpose of the evaluation model is to assess the

effectiveness of the use of educational resources as influenced by the school plant. The growing scarcity of certain resources needed to operate schools mandates the more effective use of available resources. Greater efficiency in space utilization, quicker and more systematic responses to the need for building renewal, and the elimination of waste due to under-utilized buildings are representative problems for identification and assessment.

Guideline 2

The evaluation model should be designed on the assumption that a congruence of purpose exists between the physical plant and the educational program. The educational program has a definite set of purposes. On the other hand, educational facilities have no reason for existence aside from that of servicing the educational program. Facilities do not exist as ends in themselves. Consequently, the purpose of the school plant must either coincide with that of the educational program or the plant has no reason to exist. When this is understood and accepted, the purpose of school plant evaluation is more clearly perceived.

Guideline 3

Selected modules of the evaluation model are to be assessed according to an absolute set of values while others are evaluated according to relative or normative criteria.

The evaluation process assumes the comparison of "what is" with "what should be." The evaluation model should be designed so that those modules

subject to regulation and control by state regulatory agencies can be compared with the absolute criteria fixed by those agencies as mandatory standards. On the other hand, there are certain components of the school plant that are not controlled by regulatory agencies. In those cases, the quality of such components can be evaluated on a relative or normative basis.

Guideline 4

The evaluation model should be comprehensive in scope. If the model is to serve a wide variety of purposes, it must be capable of broad application. While it may be impossible to anticipate all potential uses, a model designed to assess the technical aspects and educational adequacy of a building should cover most possibilities. Exceptions would include evaluation of a special nature.

Guideline 5

The processes of the model should be continuous and should provide for the recycling of evaluation data. Continual assessment requires sensitive feedback of evaluation data and the recycling of evaluation processes to allow for the modification and adjustment of building features to meet program needs. It is through this process that school buildings can be continually adjusted so that educational objectives can be accomplished and educational obsolescence controlled.

Guideline 6

The standards or criteria used for evaluation purposes should be allowed

to vary in accordance with local conditions and local expectations. Local school conditions vary widely among school districts and, for that matter, from school-to-school within a school district. Some school districts have more funds with which to support schools than others. Consequently, they are more able to provide better quality school buildings. Until state or federal funds are available with which to equalize educational facilities, standards of quality must be based on local conditions and the willingness of local communities to provide support for school building improvements.

Guideline 7

The evaluation model should generate results that are as objective and as refined as possible. Rating scales and score cards have been widely used to measure the adequacy of school buildings. An inherent weakness has been that such instruments reflect the basic points of view and educational values held by the raters and, therefore, their use usually results in as many different scores as there are raters. As much objectivity as possible should be built into the evaluation instruments to avoid recognized pitfalls. Refinements needed to produce greater reliability of measurement should be an integral part of the model.

Guideline 8

The model should provide for the display of results in terms of the modules that form the model and according to levels of acceptability. The display of evaluation results should provide the basic information needed

to improve those building features that affect educational outcomes. The appraisal results should answer questions relating to the improvement of building utilization, economies of operation, reduction of crowding, improvement of building condition and improved balance between curricular requirements and available space.

The Evaluation Model

The purpose of the model is to provide a comprehensive and systematic approach to the evaluation of the school plant. The model consists of three major subsystems which include 12 separate components. The three major subsystems are the qualitative subsystem, the quantitative subsystem and the process subsystem. The qualitative subsystem is the process involved in comparing the condition and quality of existing facilities with the criterion models of "what should be." The quantitative subsystem is the process of inventorying available facilities and estimating the current capacities of school plants. The evaluation process subsystem is the systematic approach used in planning the evaluation and in processing the information to determine the extent to which the school plant fulfills its purposes.

The components of the qualitative subsystem include:

1. Performance
2. Utilization efficiency
3. School plant effectiveness
4. User perception
5. Economic Feasibility

The components of the quantitative subsystem are:

1. Inventory
2. Capacity estimate

The processing subsystem includes the following components:

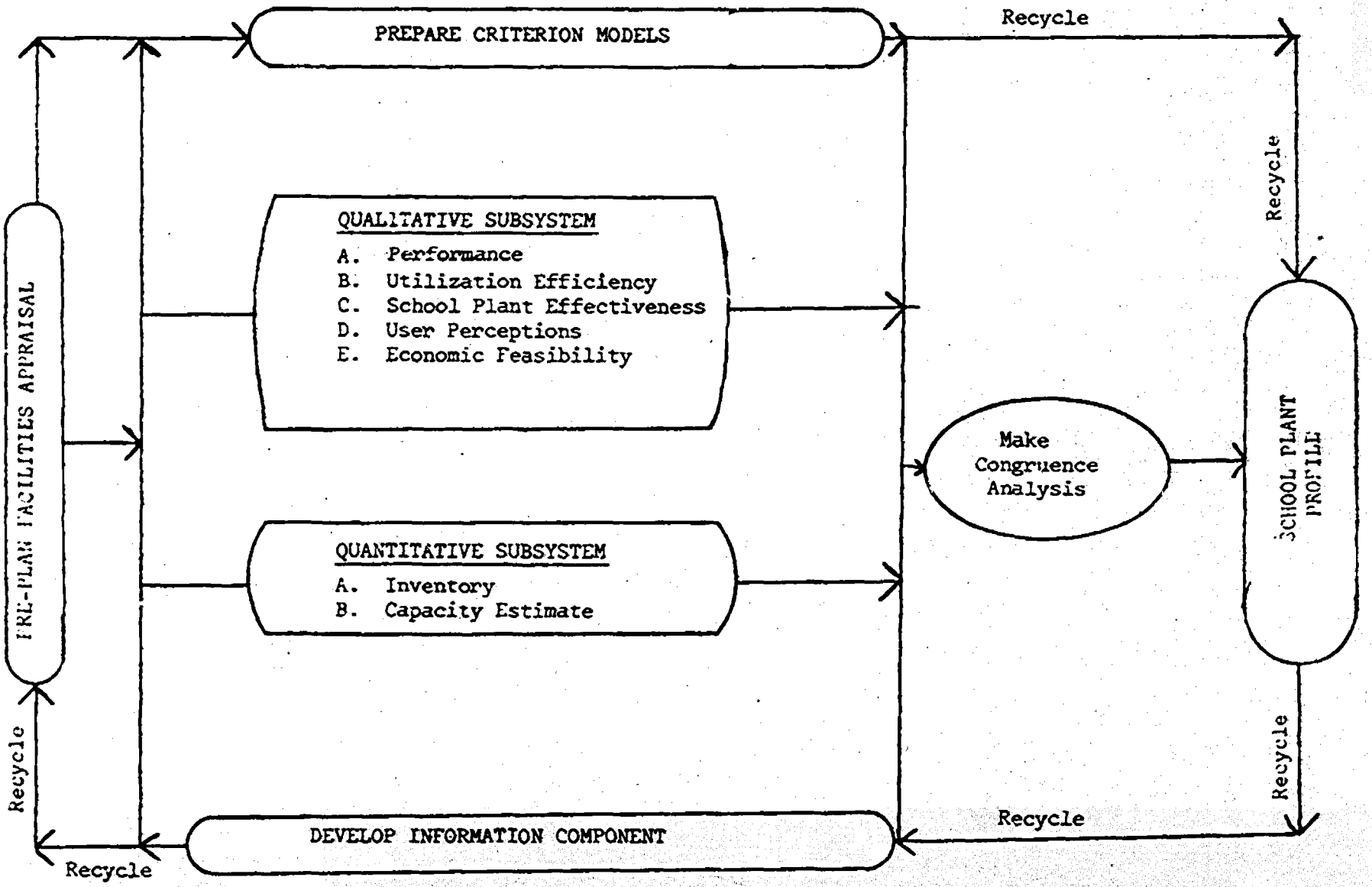
1. Pre-planning the evaluation
2. The criterion models
3. Information component
4. Congruence analysis
5. The school plant profile
6. Recycle

Figure 2.1 is a symbolic model which displays the components of the evaluation system and their interrelationships and interdependencies. A full discussion of the subsystems and components of the model and their interrelations is essential to an understanding of the model. A full discussion of the subsystems and components of the model is provided in the chapters that follow in this monograph. Chapter III discusses the process subsystem. The qualitative subsystem is examined in Chapter IV. The quantitative subsystem is presented in Chapter V.

The letters in the acronym, MEEB, represent Model for the Evaluation of Educational Buildings. The model was developed as an overall scheme for accommodating the process, tasks and data variables involved in the appraisal of a particular educational facility.

FIGURE 2.1

MEEB: MODEL FOR THE EVALUATION OF EDUCATIONAL BUILDINGS



III

THE PROCESS SUBSYSTEM

Introduction

Evaluation is perceived as a dynamic function of a management system. It is supportive of management not synonymous with it. Evaluation assumes the existence of a system that has a mission - a system with purposes that can provide the basis for determining what its level of performance and accomplishment should be. When the purposes of the system are known and understood, its performance can be monitored in accordance with those purposes. Deviations of performance outside of permissable limits can be detected and an appropriate course of action determined and prescribed to restore the system to its expected level of performance. Thus evaluation is perceived as an ongoing process - a process that is continuously recycled. It is an integral part of control which is a subsystem of a complete management system.

The processes described in this monograph are intended to be in harmony with the basic concepts outlined in the preceding paragraphs. The educational plant is considered a system - a subsystem which is a part of the larger system - a school. The mission of the educational plant is congruent with the mission of the school. Therefore, the purposes of the school plant are derived from the school's purposes.

The steps in the process of evaluating the school plant are as follows:

1. Pre-planning the evaluation
2. Developing criterion models
3. Processing Information

4. Making congruence analysis
5. Preparing the school plant profile
6. Recycling the process

The steps in the process are discussed in the following pages.

Pre-Planning the Evaluation

Pre-planning the evaluation involves a number of clearly identifiable steps. A brief discussion of the steps is presented to clarify.

Before evaluation is undertaken, an appropriate policy should be adopted by the governing agency to implement a systematic evaluation plan. The policy statement should be incorporated with an overall management plan that provides for monitoring the use and condition of educational facilities.

Once a policy has been authorized a plan of action is needed to implement the evaluation system. The plan of action should include specific objectives to be served by the evaluation process, proposals for monitoring school plants, procedures and critical tasks for data gathering, criterion models, sources of evaluation standards, staff assignments and responsibilities and limits of tolerance before adjustments are made to the performance characteristics of educational buildings.

Developing Criterion Models

An essential element in the evaluation process is the preparation of a set of standards to be used as a basis for judging the adequacy of performance of the school plant. The technique used in the MEEB System is to

identify the features or items of the school plant to be evaluated and to prepare a series of models which consist of a set of performance indicators. Where appropriate a criterion model is developed for each type of school plant to be evaluated (See Appendix B). Usually this requires the preparation of a criterion model for an elementary school, a middle or junior high school and a senior high school. The performance indicators are scaled according to the five levels of adequacy of the rating scale used.

The standards used as a basis for the development of performance indicators are derived from a variety of sources. Standards perceived as adequate are derived from the requirements of accrediting agencies or from other agencies with power to control school plant design features, i.e., health department or fire marshal. Superior standards are selected from professional organizations or planning agencies such as the Council of Educational Facility Planners or the American Library Association.

Marginal and inadequate categories are derived from local conditions. Marginal ratings are established from "average" conditions in the school system. Conditions which are readily converted to a quantitative value can be averaged. This average value is then considered the mid-point of the marginal category which extends upward to the adequate value and downward to the point on the scale equal to one standard deviation below the arithmetic mean. Inadequate conditions are the values on the scale which are lower than one standard deviation below the mean. The standard deviation is calculated by the formula,

$$\sigma = \sqrt{\frac{\Sigma x^2}{N}}$$

The reader is referred to any standard text on statistics for a discussion of the meaning and use of the standard deviation as a means of measurement. It serves an extremely useful purpose where it is clearly indicated that the facilities of a school or school system do not meet minimum standards set by state policy.

Information Component

The process of gathering information for the evaluation likewise, involves a number of carefully planned steps. Data that are relevant to an evaluation should be carefully defined before efforts are made to collect it. The role that data are expected to play and where and how data will be used in the evaluation should become the primary guide as to what and how much are needed.

Data must be of some utility or there is no reason to collect it. Data are needed to help set standards and to aid in the preparation of criterion models. Data are needed to describe the reality of existing conditions or performances which are the objects of the evaluation. Clearly, data should be collected that are useful in comparing reality with the criterion models and arriving at conclusions about the discrepancies that exist. Data must be of value in arriving at final conclusions or they should not be collected.

An ill-defined mass of data has no place in a systematic evaluation process. Processed data, however, can become valuable information for use by the decision-maker. Data are transformed into information when it serves the decision-maker by helping him identify and solve specific

problems. Unfortunately, not all data will prove to be of such utility.

Systematic collection can proceed when needed data have been identified. Evaluation instruments should be designed and constructed to facilitate the data collection process. A variety of evaluation instruments have been devised and used as indicated in an earlier section of this monograph. The data items identified should be made a part of that instrument.

The evaluation instruments used in the MEEB System are included in the Appendices. Five evaluation and data collection instruments are included:

1. A Site Appraisal Form
2. A Building Appraisal Form
3. A Space Appraisal Form
4. A Room and Pupil-Station Utilization Form
5. A Current Average Daily Membership by Grades and by Schools Form

A full description of the above forms and their use are provided in Chapter IV of this monograph.

Congruence Analysis

Strayer and Englehardt (1923) developed a score card embodying the elements and standards that represented the "perfect school plant" for an elementary school. This score card was used as an instrument of measurement to evaluate elementary school buildings. Thus the concept of comparison with a set of reference standards was introduced as an evaluation process.

Sumption and Landes (1957) expanded on the idea of comparing existing

school plants to a "perfect" model. A specific item in the comparison process was scored in proportion to how well it measured up to a predetermined standard. In the same work, Sumption and Landes (1957) also advanced the concepts of "conformance" and "best fit" which were the basis for the design of a set of procedures for evaluating school plants used by them in educational building surveys.

The concepts of "conformance" and "best fit" are basic to the idea of "congruence" proposed by Malcolm Provus (1970). According to Provus a congruence test is a comparison of a model with reality on specific dimensions defined by the model. The reported results of a congruence test produces discrepancy information.

The MEEB System utilizes the concepts of "conformance" or "best fit" as a meaningful approach of generating evaluation information about discrepancies of school plant characteristics and performance. Decision-makers responsible for school plant programs and school principals who receive discrepancy information about their school plants must choose a course of action to either eliminate the discrepancies or change their values. Of course, managers can always take no action.

The MEEB System utilizes criterion models for the measurement of reality on a comparison basis. Criterion models are simply constructs of reality based on a set of criteria or standards that represent an idealized school plant. The criterion model or models serve as a basis for the evaluation of a school plant characteristic or performance.

School Plant Profile

The results of the evaluation are reported as information for decision-making purposes. Decision-makers must have explicit information on the results in order to be in a position to act on discrepancies indicated. A purpose of the evaluation is to produce desired results.

The evaluator has three options for reporting the findings of the evaluation process. First, a descriptive report may be written to present pertinent information such as the major characteristics of the school plant, the extent of adequacy of its performance, and needs for improvement with stress on discrepancies that were detected in the congruence analysis. A second option is to present information in tabular form that highlights the characteristics of school plants and the results of the congruence analysis. Finally, the evaluation scores may be presented in graphic form summarizing the evaluation ratings given to various features and functions of the school plant for comparative purposes.

As used in this monograph a school plant profile is a short vivid description of the outstanding features or characteristics of the school plant. The MEEB System utilizes all three alternatives as the basis for reporting evaluation results. A format for presenting the descriptive report, a format for the tabular presentation of pertinent data and the format for a graphic display of results are presented in Appendix C.

Recycle

An essential element in the effectiveness of management is information.

There is an abundance of literature on the development of management information systems and their role in providing management with the information it needs for adequate planning and control of its activities.

The point has been made already that evaluation is a part of the function of management control. Evaluation furnishes the information that underpins the process of management control. Beer (1959) stated that the principal idea underlying control is that of feedback. The feedback of information to appropriate managers is a vital step in the process of taking action to correct discrepancies that are detected in the system through the evaluation process.

The MEEB System provides for the periodic recycling of the evaluation process. The continuous feedback of inventory and evaluation information is essential since neither enrollments nor the educational program is stable. Furthermore, through the processes of use and aging, building obsolescence is a continually emerging problem. Thus through continuous feedback of information and the periodic recycling of the evaluation process, a more effective school plant can be maintained to service the educational program.

IV

THE QUALITATIVE SUBSYSTEM

Introduction

The purpose of the qualitative subsystem is to provide a comparison of the detailed characteristics and functions of the school plant with a definitive set of standards or criteria. The role of the qualitative subsystem is distinguished from that of the quantitative subsystem in that the latter deals with the assessment of the number (quantity) of pupils that can be accommodated in a particular school plant.

The qualitative subsystem of MEEB consists of the following components:

1. Plant Performance
2. Utilization Efficiency
3. School Plant Effectiveness
4. User Perceptions
5. Economic Feasibility

The components are so structured that either one or more of them can be used separately in an evaluation. Each component is discussed in the following pages.

Plant Performance

School plant performance is defined in the MEEB System as the extent of conformance with a set of performance indicators. The performance indicators form the criterion model and the level of acceptability is the level on a five level rating scale.

The Rating Scale

The five level rating scale is as follows:

1. Missing - the feature is needed but non-existent.
2. Inadequate - the feature is present but clearly impedes the functioning of the process it purports to support. Standards are clearly not met.
3. Marginal - the feature does not meet standards. The level of adequacy permits limited use but performance is restricted.
4. Adequate - the feature is present, the level of adequacy clearly meets established standards and is functioning well.
5. Superior - the feature clearly exceeds established standards and the level of performance exceeds expectations.

Evaluation Forms

The school plant is divided into three major categories for evaluation purposes:

1. The site
2. The buildings
3. Rooms and spaces

Rating forms were developed so that they could be coordinated with the appropriate criterion model. The rating forms were included in Appendix A.

The site evaluation form provides for the rating of the following items:

1. Location
2. Drainage
3. Environment
4. Safety
5. Size
6. Terrain
7. Drives
8. Parking
9. Landscaping
10. Playgrounds
11. Bus loading
12. Utilities
13. Traffic control
14. Access
15. Exterior lighting

The evaluation form for buildings provides for the rating of the following building components:

1. Structure
2. Exterior walls
3. Roofing
4. Heating type
5. Heating Distribution
6. Cooling type
7. Ventilation
8. Fenestration
9. Electrical system
10. Plumbing
11. Sanitary system
12. Artificial lighting
13. Emergency lighting
14. Automatic sprinklers
15. Fire alarm
16. Interior partitions
17. Floors
18. Ceiling

The evaluation form for rooms and spaces provide for the rating of the following items:

1. Interior finish
   - Walls
   - Floors
   - Ceilings
2. Lighting
   - Artificial
   - Natural controls
3. Heating system
4. Cooling
5. Ventilation
6. Windows

7. Chalkboard
8. Tackboard
9. Location
10. Condition
11. Furniture
12. Storage

Performance Indicators

Performance indicators are the elements of the criterion model that guide the evaluator in making a selection from among alternative rating choices. An indicator is not an absolute measure of adequacy, only an indicator of adequacy level. Each element of each school plant category selected for rating requires a set of indicators. Examples of indicators are presented for purposes of illustration. The performance indicators and consequently, the criterion models which they form will and should vary from one place to another.

Site Component Illustrations

A few illustrations are given to demonstrate the concept of performance indicators. The size module can be readily illustrated. Examples of rating levels include:

5. Superior - equal or exceeding the acreage recommended by the Council of Educational Facility Planners, Int.
4. Adequate - equal to or exceeding the acreage required by the State Department of Education, but less than superior.
3. Marginal - below the adequate standard but not less than the acreage represented by that equal to one standard deviation below the mean for the school system.

2. Inadequate - below the acreage indicated as marginal.

1. Missing - not applicable

Another good illustration can be made with the drive module. Examples of rating levels include:

5. Superior - paved with curbs and gutters

4. Adequate - paved

3. Marginal - gravelled

2. Inadequate - unpaved

1. Missing - drives unmarked or nonexistent

Building Component Illustrations

Selected examples will serve to illustrate the use of performance indicators in the evaluation of building components.

The structure module provides one example:

5. Superior - modular non-loadbearing system

4. Adequate - non-loadbearing

3. Marginal - mixed loadbearing and non-loadbearing

2. Inadequate - non-loadbearing closed system

1. Missing - not applicable

Artificial lighting can be used as still another example:

5. Superior - 100 footcandles at desk top level with balanced brightness

4. Adequate - 65 footcandles at desk top level with balanced brightness

3. Marginal - 30 to 65 footcandles at desk top with glare
2. Inadequate - under 30 footcandles and excessive glare
1. Missing - no artificial lights and no glare controls.

Room/Space Illustration

The space/room form is used to collect data about what exists. The purpose of the form differs from that of the site and building rating forms in that these forms were designed not only to collect data but also to generate a field evaluation at the site. The congruence test of individual space/room data is made in a more formally structured congruence analysis after the field data are collected.

The congruence analysis may be made of one or more of the space/room modules. An illustration of a performance indicator is as follows:

5. Superior - permanent space functioning in a superior way.
4. Adequate- permanent space functioning satisfactorily.
3. Marginal - temporary or permanent space functioning under handicaps or restrictions.
2. Inadequate - makeshift or temporary space clearly incompatible with function.
1. Missing - no space available, non-existent

Utilization Efficiency

Utilization efficiency is a measure of the extent to which the use demands of the educational program match available spaces. Achieving full

performance in terms of potential use is not automatic. Efficient use is a function of appropriate provision and design of space as well as effective management.

Morphet (1927) calculated building use on the bases of room and pupil-station utilization. Room utilization refers to the extent to which a teaching station is in use during a particular time frame while pupil-station utilization is concerned with the use made of pupil seats or work stations during a similar amount of time. The type of schedule and its time modules will determine the time frame to be analyzed. The analysis of a rotating schedule that completes its full cycle in two weeks would be different from a schedule that repeats its cycle daily.

In the MEEB system, utilization efficiency is the percentage of pupil-station use determined by the ratio of pupil-stations used to those available for use during a predetermined time period. The data required for analysis are gathered by completing Form D.1 included in Appendix D. The analysis of these data should point up idle rooms and pupil-stations as well as underutilized rooms and spaces. The fit of room and class sizes as well as the efficiency of the school's schedule can also be examined. Judgments can be made as to whether a school plant is underutilized or overcrowded.

Researchers have suggested attainable utilization levels. Englehardt and Englehardt (1930) found best practice in departmentalized programs to range between 68 and 80 percent of pupil stations. Utilization of pupil stations above 85 percent could result in overcrowding of some spaces of the building. Englehardt and Englehardt (1930) also stated that school buildings with less than 60 percent utilization were either poorly planned or

inefficiently administered.

There has been a general lack of agreement as to what constitutes an acceptable level of utilization. For this reason, criteria or standards of utilization should reflect local conditions and practices. Normative practice adjusted for obvious underutilization and overcrowding in the school district may be a suitable guide. The evaluator must make the final determination as to the criterion model to be used.

School Plant Effectiveness Index

The question of what constitutes an effective school plant is unsettled. The literature on educational buildings provides little assistance in the search for a single measure to gauge the effectiveness of a school plant. Perhaps this is to be expected since there are no standard measures of the adequacy of a curriculum or the quality of instruction. After all how can the effectiveness of a building be measured when the quality of the service it is supposed to provide is immeasurable. The literature and research on educational buildings do provide some leads, however. If one accepts the premise that education should prepare people for living in our culture, then preparation to meet vocational and professional needs, as well as, general education must be provided. This requires that the school plant have the spaces required to accomplish this purpose and be capable of being rearranged or adjusted to a variety of uses to meet changing needs.

Economy has always played a major role in the provision of educational buildings (Handler, 1960). According to Handler, versatility, adaptability, expansibility and convertibility are characteristics which should be built

into school buildings to save money. The School Planning Laboratory at Stanford has established a close relationship between compactness and subsequent maintenance and operation expense. Compactness was found to have a strong negative relationship to initial building cost.

In the MEEB System, four factors are combined to generate the School Plant Effectiveness Index. These include the productivity factor, the classroom capacity factor, the instructional-space efficiency factor and the convertibility factor.

The productivity factor is a measure of the school plant's contribution to producing high school graduates ready to take their next steps--either college entrance or entry into the World of Work. The productivity of the school plant relates to its capability to generate and support adequate and appropriate educational programs and services for the students which the school serves. For those who enter college, adequate spaces are required for college preparatory programs. For those who go to work, adequate spaces are necessary for vocational and technical education programs. The formula used to generate the productivity factor is expressed as:

$$P_E = 100 - \frac{(N_s - E_s)}{C}$$

Where P_E is productive efficiency, N_s is the number of needed specialized pupil stations, and C is the total estimated capacity of plant. E_s is the number of existing specialized pupil stations.

The instructional-space efficiency factor is the relationship of total instructional space to the total space in the school plant compared to an acceptable standard. For example, a take-off of instructional space for a school

plant produces 52,374 square feet of instructional space, and 84,200 square feet of total space. The instructional space is 62.2 percent of total space. A widely recognized criterion is that instructional space should be 70 percent of the total space. The difference in this case between the criterion and the example school was 7.8 percent. A space efficiency factor of 92.2 percent is the result.

The convertibility factor is a measure of the extent that a school plant is capable of producing changes to its instructional space and the degree of obsolescence of its building equipment. There are two aspects that generate the convertibility factor, (a) convertible building components (b) obsolete building equipment. Eight building components make up one aspect of the convertibility factor. These components either exist or not and their existence is a direct measure of the convertible characteristics of the plant. The convertible components include demountable/relocatable interior partitions, relocatable lighting, relocatable heating and air conditioning system, relocatable casework and cabinets, relocatable modular ceiling, modular structure, roofing/insulation and continuous acoustical flooring. The number of the foregoing that exist in a school building is entered in the formula.

There are five components that make up the building equipment obsolescence factor; heating and air conditioning, lighting, acoustical ceiling, casework and cabinets and acoustical flooring. The number of these judged obsolete are entered in the formula. The convertibility factor is represented by the formula:

$$\text{Convertibility} = \frac{\text{No. Convertible Components}}{8} - \frac{\text{No. Obsolete Components}}{5}$$

The classroom capacity factor is a measure of the extent to which the size of class sections match classroom capacities. Table 4.1 shows a compilation of class sections in relation to classroom capacities. The number of class sections outside the heavy lines in the table is deducted from the total and the remainder is expressed as a percentage of the total. The result is the classroom capacity factor.

The school plant effectiveness is expressed in the following formula:

$$SPEI = \frac{S_E + 2P + 2CO + C_u}{6}$$

Where:

(1) S_E is the instructional-space efficiency factor

(2) P is the productivity factor

(3) CO is the convertibility factor, and

(4) C_u is the classroom capacity factor

User Perceptions

The users of the school plant, consciously or sub-consciously, respond to the qualities of facilities provided to house them and their programs. Overt user responses are likely to be generated by those design features that directly affect the sensory apparatus of the user. In particular, overt expressions are most likely to be illicited when the user is unable to make a satisfactory and complete adaptation to specific design characteristics that affect his feelings and interfere with the behavioral patterns which he perceives as pertinent to his activity.

The good educational manager will seek to remove barriers to good instruction caused by design features of a school plant. Features that cause

TABLE 4.1

COMPARATIVE DATA ON INSTRUCTIONAL ROOM CAPACITIES
AND SIZE OF CLASS SECTIONS
EXAMPLE HIGH SCHOOL

	Size and Number of Class Sections				
Capacity of Instructional Rooms	10 or under	11 to 20	21 to 30	31 to 40	40 or above
10 and Under					
11 to 20	1	19	5		
21 to 30	3	32	59	33	
31 to 40	3	3	38	5	
40 or above	4	3	15	1	1
Makeshift Arrangements	5		3	5	
Totals	1/18	51/57	97/120	6/44	1/0

dissatisfaction frustration or that threaten the security of a teacher or a learner. The evaluation should seek to find and evaluate such problems so that the manager can act to modify the situation and to relieve problems caused by the facility.

To facilitate this type of evaluation, the MEEB system provides a series of scales that were developed to illicit responses by pupils, teachers and principals. These scales are included in Appendix E.

The principal's scale (E.1) was designed to illicit the attitudes of the principal toward particular buildings. Such factors as aesthetics, safety, noise, security, spaciousness, pleasure, disorder, lighting, crowding, convenience, color and function are included in the inventory. This inventory has been used with some degree of success. Tests of reliability and validity have not been made.

The teachers' scale (E.4) was designed for the same reason and includes essentially the same factors as the principals' scale. No tests of validity or reliability have been run on this scale.

Two scales have been developed and used with pupils of elementary school age. The scale used with pupils of grades 4-7 was included in Appendix E.11 and with pupils in grades 2-4 in Appendix E.9. Both scales have been subjected to statistical analysis yielding satisfactory reliability coefficients. The scale developed for grades 2-4 was found to have a Kuder Richardson Test Reliability of .832. The scale developed for grades 4-7 produced a reliability coefficient of .935.

The scales can be used to assess the overall acceptability of one type of school building design in comparison with another. An analysis of the various items can reveal the acceptance or rejection of certain features

by those who respond to the inventory form. Important clues as to the acceptability of various features are provided so that a more detailed follow-up can be made if there is general agreement on a particular one.

Economic Feasibility

Ultimately a school building reaches a state where it should be either modernized or replaced. Deterioration and obsolescence are realities which planners and managers of educational facilities must eventually confront in the lifetime of a school building. Of course, it takes a long time for a building to deteriorate to a point that its occupants are subjected to undue hazards. On-the-other-hand, school buildings are far more likely to become obsolescent than to suffer from deterioration.

Handler (1960) reported on a study of 567 non-rural schools in the State of Michigan that had been reported as unsatisfactory on a statewide inventory. His findings were based on complete and usable replies about 285 school buildings that were unsatisfactory and, therefore, needing to be abandoned. The study revealed 882 defects which were classified into correctible and non-correctible categories. The following classifications were identified by Handler:

1. Non-correctible
    a. Poor location
    b. Inadequate site
    c. Unsatisfactory environment
    d. Educational obsolescence
2. Correctible
    a. Structural hazards
    b. Fire hazards
    c. Obsolescent service systems such as heating, plumbing, lighting

The major reasons given for abandonment were poor location and educational obsolescence. There appeared to be a tendency to accomodate to structural and service system defects until either intolerable conditions were reached or other factors such as educational obsolescence had begun to operate.

Handler concluded that school boards seldom had much factual basis upon which to base their decisions to abandon or retain a school building. School board decisions too often were influenced by pressures from the community or the school system. In too many cases, the decision to abandon a school building has been deferred too long leaving children to bear the consequences of poor management.

Linn (1952), Castaldi (1969) and Boles (1965) have offered guidelines or formulas for use in determining whether to abandon or retain a school building. These are useful methods and should be a part of the approach used to determine the most acceptable alternative.

Linn saw the problem of abandonment as being an economic one. Castaldi combined economic factors with a judgmental estimate of educational adequacy but in the final analysis the critical dimension was cost; i.e., an economic decision. Boles admits that his approach to the problem was to objectify subjective judgments and that his formula represented an economic judgment.

The final decision, however, is not always an economic one as was pointed out earlier by Handler (1960). By extending the work of Handler (1960), Linn (1952), Castaldi (1969) and Boles (1965) a useful set of guidelines were developed as a part of the MEEB System. The guidelines are as follows:

1. Abandonment should be considered if any one or more of the following conditions exist:

   a. Uncorrectible unsafe structure
   b. Uncorrectible educational obsolescence
   c. Uncorrectible hazards to life safety
   d. School location removed from and poorly accessible to the school population served
   e. Small and inadequate site impossible to expand to support an economical school organization unit.

If one or more of the foregoing conditions exist, abandonment is definitely indicated.

2. Further, abandonment is indicated if the cost of modernizing the existing building should be more than the cost of new construction to replace an old building when the remaining useful building life is considered. This consideration is based on the concept that the educational and economic benefits of retaining an old building should equal or exceed those obtained by constructing a new building to replace the old. This concept is expressed in the formula by McGuffey (1969).

$$\text{If } \frac{C_m}{L_1 \times B_{s1}} > \frac{C_r - S_e}{L_2 \times B_{s2}},$$

then retain the old building and modernize it.

The factors in the formula are as follows:

C_m is the cost of modernizing the old building to correct all of its deficiencies including structural, health, safety and educational defects.

L_1 is estimated useful life expectancy in years of the modernized school plant.

B_{s1} is square feet of space in the modernized school plant.

C_r is the cost of the new plant to replace the old.

S_e is salvage or sales value of the old school plant.

L_2 is estimated useful life expectancy of the new school plant.

B_{s2} is the square feet of space in the new school plant.

The foregoing formula assumes that the cost of modernizing the old building can be determined by bidding if necessary to establish an objective figure. Current data on cost of new construction can be compiled from recent experience with similar facilities.

Useful life expectancy for both the old and new school buildings can be estimated by professionals using the concept of "remaining useful life expectancy." The square footage of the old facility can be measured using a comparable method to that used to compute the square footage for the new building. Either the ASA or the AIA formula can be used.

V

THE QUANTITATIVE SUB-SYSTEM

Introduction

The primary purpose of this monograph was to describe the qualitative subsystem for the evaluation of educational buildings. The Model for the Evaluation of Educational Buildings was developed as a comprehensive system which includes a quantitative subsystem designed for the purpose of estimating the capacity of educational buildings. This chapter presents a brief discussion of the quantitative subsystem A more complete description of the MEEB quantitative subsystem is included in Systematic Planning for Educational Facilities, McGuffey (1973)

School Plant Capacity

School plant capacity is the estimated number of pupils that a school plant can accomodate at any one time during normal operation without overcrowding and adversely affecting the educational program. It represents the summation of the number of pupils stations available for use in instructional spaces adjusted by critical factors affecting space use such as teacher load, class size, classroom size and scheduling practices.

Elementary school capacity is computed in the same way that secondary school capacity is computed. The mathematical model used for the computation of operating capacity is as follows:

$$C_p = U \sum_{i=1}^{n} C_i \quad \text{where}$$

C_p is the estimate of total school plant capacity.

U is the utilization factor according to a predetermined set of utilization values for different size school plants.

C_i is the capacity of each instructional space in the school plant.

In order to compute the capacity estimate for the total plant, individual room capacities must be estimated. The formula for individual room capacities is based on three factors that are variables reflecting local practices pertaining to teacher-pupil load, classroom size and policies or standards regulating classroom size. The formula for computing individual room capacities is:

$$C_i = \frac{A_i X_i}{b_i} \quad \text{where}$$

C_i is the estimated capacity of an instructional space or teacher station

A_i is the teacher-pupil load assigned by the school or school system

b_i is the square foot standard for a teacher station

X_i is the actual amount of square feet in a teacher station

The upper limits on the capacity of a teacher station may be fixed at a capacity not greater than the number stipulated by the teacher-pupil load policy. If the capacity of a multiple teacher space is computed, the upper limit may be fixed at the equivalent multiple of the teacher-load policy. This may be desirable because the formula may generate a result above or below the teacher-load depending upon the size of the existing space.

Utilization Factor

The utilization factor is a measure of the efficiency of the use of space in a school plant. For maximum efficiency the capacity of a school plant must match use demands. However, as has already been pointed out, there are a number of factors that prevent an absolute fit of the enrollment in various curricula areas with the teacher stations available in the school plant.

The MEEB System recognizes the limitations imposed by the variety of conditions that can affect capacity. Unless there are reasons to modify them, utilization criterion shown in Table 5.1 are used for computing secondary school capacities.

Elementary school plants may be organized on either a self-contained or a departmentalized plan or some combination thereof. Utilization ratios will differ with different organization plans.

The computation of the capacity of the elementary school plant organized on a self-contained basis requires the use of a utilization factor to compensate for the inability of exactly matching room sizes to class sizes and teacher-load practices. Experience indicates that pupil-station utilization can vary from 85-92 percent without crowding individual class sections. For computing elementary capacity a .90 utilization factor is used.

Departmentalization decreases the ability to use space effectively. For departmentalized programs, a utilization factor of .85 is utilized.

TABLE 5.1

Utilization Factors Used
For Computing Estimated Capacities
of Secondary Schools

Number of Teaching Stations	Utilization Factors
17 or less	.70
18-25	.75
26-45	.80
46-65	.85
Above 65	.90

Adjusted Capacity

The formulas discussed here are used in the MEEB system to compute preliminary estimates of capacity. The utilization analysis explained in Chapter IV provides the data for assessing the curriculum enrollment match with available spaces. When internal changes in space organization are indicated, the capacity is recalculated on the basis of the revised number of spaces using the same formula. The new data are simply recycled and adjusted capacities computed.

General Procedures

The general procedures followed in estimating the capacity of existing facilities are as follows:

1. An inventory system is developed to gather data on each school plant. The data forms included in Appendix A are used as both inventory and evaluation forms.
2. Enrollment data are compiled by grade and by school to be used as the criterion to determine the adequacy of school plant capacity. Enrollment forms are included in Appendix F.
3. Data on the school plant are compiled and analyzed. All temporary, makeshift and otherwise unsatisfactory teacher stations are excluded from the count for each school. Buildings to be abandoned are excluded. Preliminary capacities are estimated.

4. Utilization data are analyzed and the fit of curriculum or course enrollments to available space are determined. Space requirements to fit programs are then proposed.
5. Adjusted capacities are estimated using the capacity formulas discussed herein.

VI

SUMMARY AND CONCLUSIONS

Introduction

This monograph has described the basic conceptual background, the content and processes of a systematized approach to the evaluation of educational facilities. The system is called MEEB - an acronym for Model for the Evaluation of Educational Buildings. The principal focus of the system is on a process that compares existing educational buildings in terms of a set of standards. An analysis is made in terms of the discrepancies between "what exists" and "what should be."

Evaluation of educational buildings has been somewhat piecemeal and has lacked systemization. The MEEB system provides a comprehensive approach that has broad application and provides information to fulfill the following needs:

1. Provide up-to-date information on the condition of facilities as they may affect the general welfare of occupants.
2. Provide information required for the control of technical and educational obsolescence.
3. Facilitate the utilization of educational space.
4. Aid in maximizing the use of resources allocated to education.
5. Enhance planning and decision-making relating to the fulfillment of requirements generated by changing educational programs.

Description of the Model

A set of guidelines were used in the development of the Model. These are as follows:

1. A fundamental purpose of the evaluation model is to assess the effectiveness of the use of educational resources as influenced by the school plant.
2. The evaluation model should be designed on the assumption that a congruence of purpose exists between the physical plant and the educational program.
3. Selected modules of the evaluation model are to be assessed according to an absolute set of values while others are evaluated according to relative or normative criteria.
4. The evaluation model should be comprehensive in scope.
5. The processes of the model should be continuous and should provide for the recycling of evaluation data.
6. The standards or criteria used for evaluation purposes should be allowed to vary in accordance with local conditions and local expectations.
7. The evaluation model should generate results that are as objective and as refined as possible.
8. The model should provide for the display of results in terms of the modules that form the model and according to levels of acceptability.

The major subsystems of the model include:

1. A process subsystem

2. A qualitative subsystem

3. A quantitative subsystem

The three major subsystems are comprised of the following components:

1. Process sub-system

    a. Pre-planning the evaluation
    b. Developing the criterion models
    c. Processing information
    d. Making the congruence analysis
    e. Preparing the school plant profile
    f. Recycling the results

2. Qualitative subsystem

    a. Performance
    b. Utilization efficiency
    c. School plant effectiveness
    d. User perceptions
    e. Economic feasibility

3. Quantitative Sub-system

    a. Inventory component
    b. Capacity estimate

Process Subsystem

The process subsystem assumes that evaluation is supportive of management not synonymous with it. It also assumes that the purposes of facilities are congruent with the mission of the educational program. When these purposes are known, the performance of educational facilities can be monitored accordingly. Furthermore, deviations of performance outside of permissible limits can be detected, thereby signaling action to restore the performance to its expected level.

Pre-planning the Evaluation

The following steps were identified as essential to pre-planning:

1. The governing agency should develop policies governing evaluation.
2. Management should develop an overall plan for monitoring the use and condition of educational facilities and for determining performance discrepancies.
3. Management should develop a plan of action for implementation including objectives, proposals for monitoring plants, procedures and tasks for gathering data, identification of sources of standards, development of criterion models, staff assignments and responsibilities, and limits of tolerance in performance expectations.

Criterion Models

A set of standards or criteria are needed as a basis for judging the level of adequacy. The MEEB system utilizes a series of models that consist of performance indicators for this purpose. Criterion models are developed for a variety of applications such as space models, feeder plan models, performance indicator models. These are used to compare existing facilities with expected levels of performance or adequacy and to generate discrepancies.

Information Component

Data needed for the evaluation should be carefully defined. Data are

needed that describe existing facilities, their characteristics and performance levels. Evaluation and data forms used in the MEEB system were identified. These include:

1. Site Appraisal Form
2. Building Appraisal Form
3. Space Appraisal Form
4. A Room and Pupil-Station Utilization Form
5. User Perception Scales
6. School Membership Forms

Congruence Analysis

The MEEB system has used the concept of "congruence" as a meaningful approach to generating evaluation information about school plant characteristics and performance. The data about existing facilities are compared with the corresponding data found in the criterion models. The differences form the discrepancy information which is conveyed to the facilities manager for action or no action.

School Plant Profile

The results of the evaluation must be reported for decision-making purposes. Three options were included for reporting the results of the evaluation process. These were:

1. A descriptive report prepared for the purpose of presenting pertinent information on the characteristics of the school

plant, the extent of adequacy of performance and needs for improvement.

2. Evaluation may be presented in tabular form that highlights plant characteristics and the results of the congruence analysis.
3. Evaluation scores may be presented in graphic form which summarize the evaluation ratings given to various features and functions of the school plant for comparative purposes.

The MEEB system considers the school plant profile as a short, vivid description of the outstanding features or characteristics of the school plant. All three options presented were to be included in the MEEB system.

Recycle

Evaluation furnishes the information needed to enhance management control. The principal concept underlying control is feedback. Thus the feedback of information to appropriate managers is a vital step in taking action to correct discrepancies.

The MEEB system calls for the periodic recycling of the evaluation process. Since neither enrollments nor educational programs are stable, continuous feedback of information and the recycling of the evaluation processes seems mandatory.

The Qualitative Subsystem

The qualitative subsystem provides a means of comparing the characteristics and functions of the school plant with a set of standards. It

consists of the following components:

1. Plant performance
2. Utilization efficiency
3. School plant effectiveness
4. User perceptions
5. Economic feasibility

The above components are structured so that either or all may be used in an evaluation. Performance indicators form the models for comparison purposes. Performance indicators were developed for each evaluation in accordance with a set of levels as indicated below:

1. Missing
2. Inadequate
3. Marginal
4. Adequate
5. Superior

Evaluation forms were developed for rating school plant characteristics in terms of performance levels. The forms were prepared so that they could be coordinated with the appropriate criterion model. Evaluation forms were developed for the following:

1. The site
2. The buildings
3. Rooms and spaces

Utilization Efficiency

Utilization efficiency is a measure of the extent to which use demands match available space. Efficient use is a function of appropriate provision for space as well as effective management.

In the MEEB system, utilization efficiency is the percentage of pupil-station use as determined by the ratio of pupil-stations used to those available for use during a designated time period. The analysis of data was intended to reveal idle rooms and pupil-stations as well as underutilized rooms and spaces. The fit of the rooms and sizes of classes as well as the efficiency of the school's schedule can be examined. A set of use standards was presented for use in the MEEB system.

School Plant Effectiveness Index

An index designed to measure the effectiveness of the service that a school plant can render over its life span was presented. This index was composed of four measures as follows:

1. The productivity factor which was intended to measure the capability of the plant to generate and support adequate and appropriate educational programs.
2. The instructional-space efficiency factor which was intended to measure the ratio of instructional space to the total space in the school plant compared to a standard ratio.
3. The convertibility factor which was developed to measure the extent that a school plant can be changed and the extent of the obsolescence of its building equipment.
4. The classroom capacity factor which was intended to measure the extent to which class sizes match classroom capacities.

The foregoing factors were expressed in the following formula:

$$SPEI = \frac{S_E + 2P + 2CO + C_u}{6}$$

User Perceptions

The measures included in this component of the MEEB system assume that the consumers of educational facilities are capable of responding knowingly to the qualities of facilities provided for their use. It is believed that overt expressions are likely to be illicited when users are unable to make satisfactory adaptation to specific design characteristics that affect their feelings and interfere with behavioral patterns which they perceive as pertinent to their activity.

The MEEB system has provided a set of inventories or scales to measure how users perceive their physical environments. These include:

1. A principal's inventory
2. A teachers' inventory
3. Two alternate inventory forms for pupils in grades 2-4.
4. An inventory form for pupils in grades 4-7.

Economic Feasibility

Ultimately a school building reaches a state when it should be either modernized or replaced. School buildings suffer from both obsolescence and deterioration. Defects signalling obsolescence and deterioration have been identified and classified into correctible and non-correctible categories. In some cases obsolescence and deterioration may be correctible while in others they may not. A set of guidelines appeared to be needed to determine whether to abandon or remodel an old school plant.

The MEEB system provides guidelines to assist managers in making more adequate decisions. These are as follows:

1. Abandonment is indicated if any one or more of the following conditions exist.

   a. Uncorrectible unsafe structure.
   b. Uncorrectible educational obsolescence.
   c. Uncorrectible hazards to life safety.
   d. School location removed from and poorly accessible to the population served.
   e. Small and inadequate site impossible to expand to support an economical school organization unit.

2. Further, abandonment is indicated if the cost of modernizing an old building is more than the cost of new construction to replace an old building when the remaining useful life is considered. This concept was expressed in the following formula:

$$\frac{Cm}{L_1 \quad X \quad B_{s1}} \quad > \quad \frac{Cr - Se}{L_2 \quad X \quad B_{s2}}$$

The Quantitative Subsystem

The quantitative subsystem was developed for the purpose of estimating the capacity of educational buildings in support of the MEEB system. It involved an inventory to count the number of instructional spaces and together with the results of the qualitative subsystem to generate data to estimate school plant capacities.

School plant capacity was presented as the estimated number of pupils that a school plant can accomodate at any one time during normal operation without overcrowding or adversely affecting the educational program. A mathematical model used for the computation of capacity was presented as follows:

$$C_p = U \sum_{i=1}^{n} C_i \quad \text{where}$$

C_p is the estimate of total school plant capacity

U is the utilization factor

C_i is the capacity of an individual instructional space

To use the formula, the capacities of individual instructional spaces must be estimated. The formula for estimating the capacity of individual instructional spaces was presented as:

$$C_i = \frac{A_i \quad X_i}{b_i} \quad \text{where}$$

C_i is the estimated capacity of an instructional space or teacher station

A_i is the teacher-pupil load

b_i is the square foot standard for a teacher station

X_i is the actual amount of square feet in the teacher station.

Utilization factors were presented for both elementary and secondary school plants. General procedures were also presented to estimate the capacity of existing facilities.

Conclusions

A comprehensive evaluation of an educational facility is a complex and involved process. For some time, the lack of a complete and more systematic method has fostered a piecemeal, intermittent approach. Too often, the need for evaluation has been ignored. This monograph has attempted to provide a conceptual basis for a comprehensive, systematic approach and, at the same time, describe a carefully developed and tested evaluation model.

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APPENDIX A: EVALUATION AND DATA FORMS

SITE APPRAISAL
EDUCATIONAL FACILITIES PLANNING CENTER
UNIVERSITY OF GEORGIA

SCHOOL: _____ PAGE: _____

ADDRESS: _____ DATE: _____

COMMENTS	COMPONENT	RATING SCALE
	LOCATION	1 2 3 4 5
	DRAINAGE	1 2 3 4 5
	ENVIRONMENT	1 2 3 4 5
	SAFETY	1 2 3 4 5
	SIZE	1 2 3 4 5
	TERRAIN	1 2 3 4 5
	DRIVES	1 2 3 4 5
	PARKING	1 2 3 4 5
	LANDSCAPING	1 2 3 4 5
	PLAYGROUND	1 2 3 4 5
	BUS LOADING	1 2 3 4 5
	UTILITIES	1 2 3 4 5
	TRAFFIC CONTROL	1 2 3 4 5
	ACCESS	1 2 3 4 5
	EXTERIOR LIGHTING	1 2 3 4 5

CODE: 1 MISSING 3 MARGINAL 5 SUPERIOR

2 INADEQUATE 4 ADEQUATE

A.2

BUILDING APPRAISAL FORM
EDUCATIONAL FACILITIES PLANNING CENTER
UNIVERSITY OF GEORGIA

PAGE: _____

ORGANIZATIONAL UNIT: _____

BUILDING NO: _____ SITE NO: _____

ADDITION NO: _____ PARCEL NO: _____

DATE CONSTRUCTED: _____ PLAN TYPE: _____

FLOOR AREA: _____ NO. STORIES: _____

TEACHER STATIONS: _____ PUPIL STATIONS: _____

DESIGN USE: _____ BLDG. CLASS: _____

COMMENTS	CODE	COMPONENT	ADEQUACY RATING
		STRUCTURE	1 2 3 4 5
		EXTERIOR WALLS	1 2 3 4 5
		ROOFING	1 2 3 4 5
		HEATING: TYPE	1 2 3 4 5
		DISTRIBUTION:	1 2 3 4 5
		COOLING TYPE	1 2 3 4 5
		VENTILATION	1 2 3 4 5
		FENESTRATION	1 2 3 4 5
		ELECTRICAL SYSTEM	1 2 3 4 5
		PLUMBING	1 2 3 4 5
		SANITARY SYSTEM	1 2 3 4 5
		ARTIFICIAL LIGHTING	1 2 3 4 5
		EMERGENCY LIGHTING	1 2 3 4 5
		AUTOMATIC SPRINKLERS	1 2 3 4 5
		FIRE ALARM	1 2 3 4 5
		INTERIOR PARTITIONS	1 2 3 4 5
		FLOORS	1 2 3 4 5

SPACE/ROOM APPRAISAL FORM
EDUCATIONAL FACILITIES PLANNING CENTER
UNIVERSITY OF GEORGIA

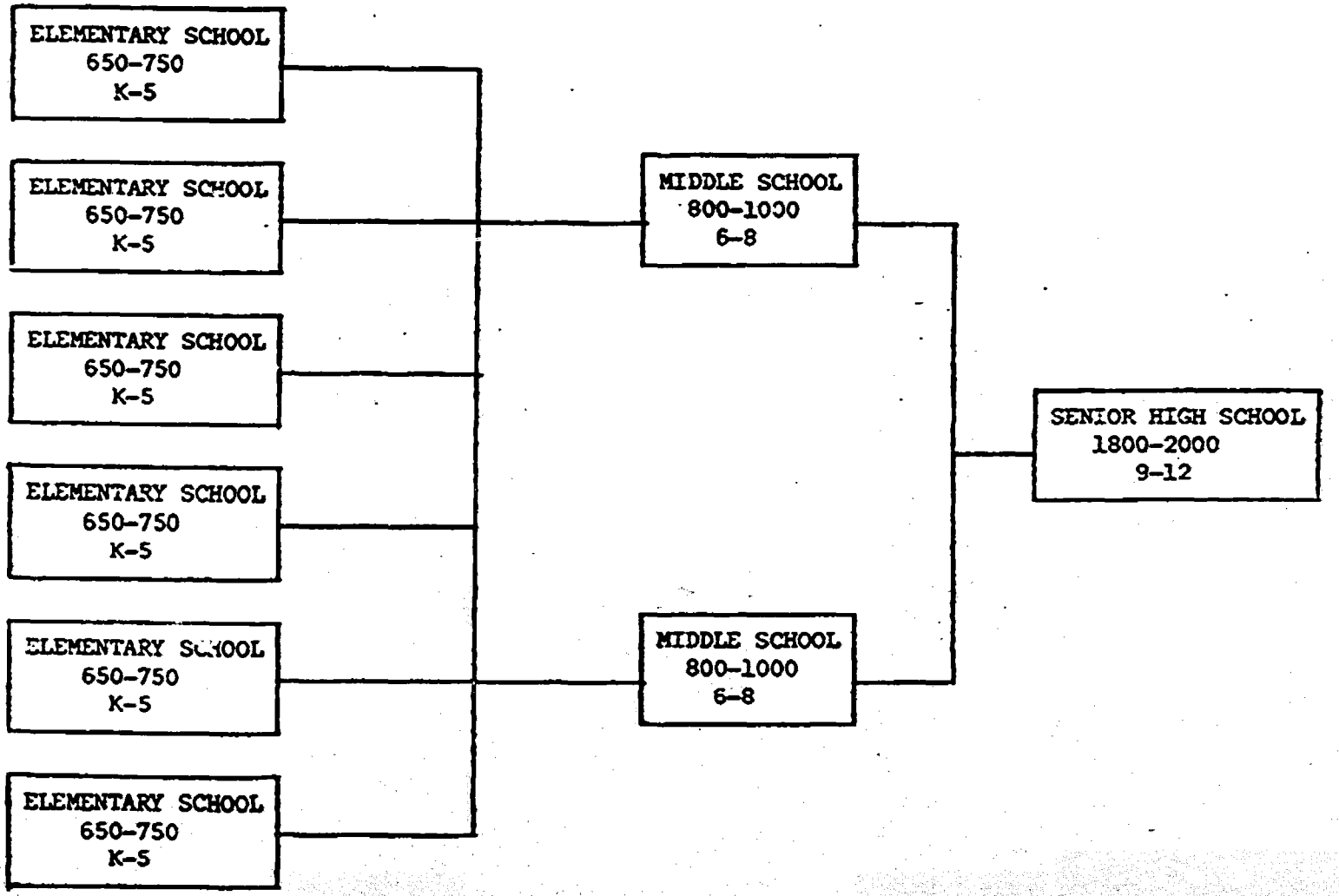
PAGE: _____

SCHOOL: _____ BUILDING: _____ ADD. NO: _____ SITE: _____

Space #												
SPACE/ROOM TYPE												
DESIGN USE												
FLOOR AREA (SQ. FT.)												
INTERIOR FINISH												
WALLS												
FLOORS												
CEILING												
LIGHTING												
ARTIFICIAL												
NATURAL CONTROLS												
HEATING SYSTEM												
COOLING												
VENTILATION												
WINDOWS												
CHALKBOARD												
TACKBOARD												
LOCATION CODE												
ROOM CLASS												
PUPIL STATIONS												
TEACHER STATIONS												
CONDITION CODE												
FURNITURE												
STORAGE												

APPENDIX B: SAMPLE CRITERION MODELS

MODEL
SIZE OF SCHOOLS AND FEEDER PLAN



CRITERION MODEL
MINIMUM SPACE REQUIREMENTS
ELEMENTARY SCHOOLS

Type of Space	No. of Units	Space Per Unit	Total Space	Capacity Per Unit	Total Capacity
1. Primary Instructional Space	16	900	14,400	25	400
2. Upper Elementary Instructional Space	10	800	8,000	25	250
3. Special Instructional Space					
Art	1	800	800	25	40
Music	1	1,000	1,000	50	0
Science	1	800	800	25	0
4. Library	1	2,000	2,000	65	0
5. Cafetorium (Multi-purpose)	1	5,000	5,000	325	-
6. Administrative Suite		2,000	2,000	-	-
a. Principal's Office	1				
b. Waiting Room	1				
c. Work Room	1				
d. Clinic	1				
e. Faculty Room	1				
f. Guidance	2				
g. Supply Storage	2				
7. Toilet Rooms	4	250	1,000	-	-
8. Storage Rooms		400	1,600	-	-
a. Custodial	1				
b. General	2				
c. Book	1				
9. Mechanical Rooms	3	400	1,200	-	-
10. Corridors & Wall Space	Calculate at 30 percent of total space.				

APPENDIX C: SCHOOL PLANT PROFILE

DESCRIPTIVE FORMAT

Abraham Lincoln Elementary,
Grades 1-6

Site:

The plant is located on a 5.36 acre site in a residential community. The size of the site is inadequate and the general appearance is marginal. There are no obvious drainage or environmental problems. Safety is inadequate due to a lack of fencing between play areas and streets. Playground equipment is satisfactory though play area is limited.

Access to the site is good; the drives are appropriate for the site and in good condition, and the parking is adequate both in quality and amount. All utilities are provided to the site.

Building:

The school plant is a two story masonry structure with a brick exterior. The building is unattractive in appearance. Some structural problems are evident; cracks are apparent in both exterior walls and interior partitions. There are load-bearing walls in the building. Fenestration is marginal; improvements and preventive maintenance are required. Roofing is adequate (built-up, tar and gravel). Building facia is lacking in appearance.

There are thirty instructional spaces including a makeshift art lab and a music room. The first floor houses the kitchen and cafeteria, the library, the auditorium, the administrative suite and four restrooms in addition to 24 instructional spaces. The second floor houses the gym, two restrooms and six instructional spaces.

All interior walls are plaster except the lunchroom which has ceramic tile walls as do the restrooms. Flooring is predominantly

resilient tile. However, eleven classrooms have wood floors. The library is carpeted. Restrooms have terrazzo flooring except the two first grade restrooms which have wood flooring and plaster ceilings and plaster walls. Ceilings are plaster throughout the building except for fiberboard in the lunchroom, accoustical tile in the library and metal in the gym.

Service Systems:

The plant does not have an HVAC system. Heating is accomplished through room radiators except for convectors in the lunchroom, art room, music room, and ducts in the gym and library. The gym and library have total air control systems. Ventilation is through windows. Restrooms are equipped with mechanical exhaust.

Safety facilities and electrical wiring are rated adequate. Plubming is rated inadequate; restroom fixtures are in poor condition. The sanitation system is marginal. Lighting is marginal due to the condition of some fixtures.

General Classrooms:

Classrooms are in marginal condition. The main problem here is that the wood floors (though well-kept) should be tiled or carpeted. Tiling on most other floors is adequate; yet some of these show signs of age and heavy use. Ceilings throughout the building are adequate in all instructional spaces and lighting, though adequate in amount, is marginal in appearance and upkeep. Chalkboards, tackboards, shelving, and cabinets are rated marginal. The space used for an art lab is a makeshift room.

General Appraisal:

This facility is old and worn in appearance. It is a two-story, structurally sound facility and the deficiencies noted can be corrected. Exterior walls have evident cracks and the trim and facia are in poor condition. Location is good; however, more fencing is needed for play areas and grounds need more work.

Weaknesses:

1. Some interior partitions are cracked and need paint.
2. Some wood floors. Flooring in lunchroom is inadequate. Tile in places needs to be replaced.
3. There is no HVAC system.
4. Fenestration is in marginal condition.
5. Plumbing fixtures need to be replaced. Restrooms are in inadequate condition (boys' worse than girls').
6. Some radiators require preventive maintenance.
7. Some instructional areas require more storage shelves and cabinets. Art is held in a makeshift room.
8. Some lighting fixtures need to be replaced.

Statement of Capacity:

Abraham Lincoln Elementary School has an enrollment of 490 pupils. The plant capacity is 890 pupils. There are no unhoused pupils and capacity is rated adequate.

SUMMARY OF RATINGS
CHARACTERISTICS OF EDUCATIONAL BUILDINGS

SCHOOL BUILDING	TOTALS Superior	Adequate	Marginal	Inadequate	Missing
Structure					
Exterior Walls					
Roofing					
Type Heating					
Heat Distribution					
Type Cooling					
Ventilation					
Fenestration					
Electrical System					
Plumbing					
Sanitary System					
Artificial Lighting					
Emergency Lighting					
Automatic Sprinklers					
Fire Alarm					
Interior Partitions					
Floors					
Ceilings					

BUILDING PROFILE CHART

The building profile chart is designed to portray the results of the congruence test in graphic form. The chart was prepared to receive rating scores converted to a 100 point scale as follows:

1. Missing = 0
2. Inadequate = 1 X 25 or 25 points
3. Marginal = 2 X 25 or 50 points
4. Adequate = 3 X 25 or 75 points
5. Superior = 4 X 25 or 100 points

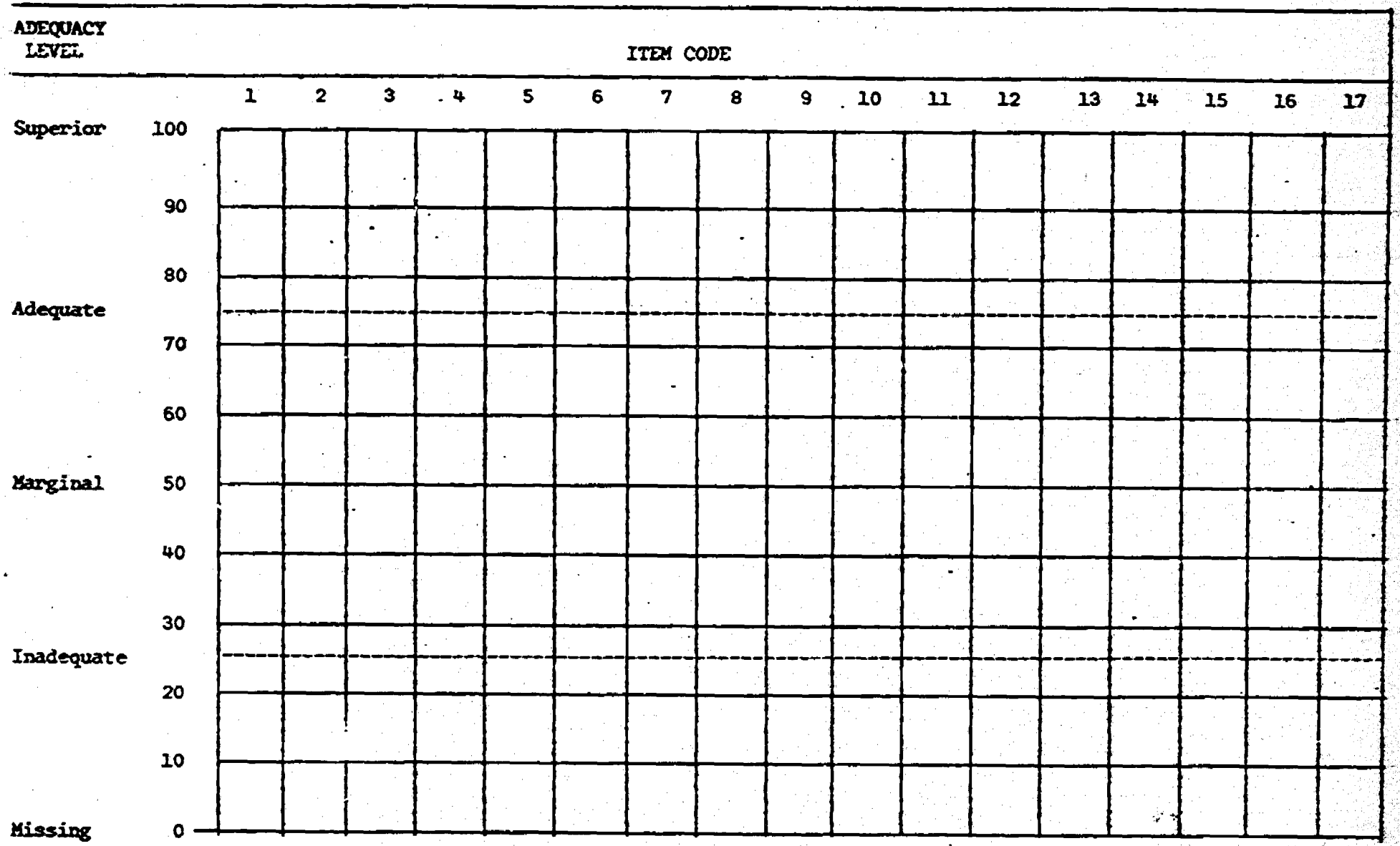
The codes for building components are as follows:

1. Structure
2. Exterior walls
3. Roofing
4. Heating type
5. Heating Distribution
6. Cooling type
7. Ventilation
8. Fenestration
9. Electrical System
10. Plumbing
11. Sanitary system
12. Artificial lighting
13. Emergency lighting
14. Automatic sprinklers
15. Fire alarm
16. Interior portions
17. Floors

BUILDING PROFILE CHART
SUMMARY OF CONGRUENCE ANALYSIS

DATE: _____

SCHOOL: _____



APPENDIX D: ROOM AND PUPIL - STATION UTILIZATION

ROOM AND PUPIL STATION UTILIZATION

NAME AND NUMBER OF ROOM OR SPACE	PUPIL CAPACITY	CLASS PERIODS, SUBJECTS, AND NUMBER OF PUPILS										
			1	2	3	4	5	6	7	8	9	10
		Subject										
		No. of Pupils										
		Subject										
		No. of Pupils										
		Subject										
		No. of Pupils										
		Subject										
		No. of Pupils										
		Subject										
		No. of Pupils										
		Subject										
		No. of Pupils										
		Subject										
		No. of Pupils										
		Subject										
		No. of Pupils										
		Subject										
		No. of Pupils										

SUMMARY
ROOM PERIOD AND PUPIL STATION USE

Building and Room Number	Room Use			Pupil-Station Use		
	Periods Used	Periods Available	Percent Use	Station Periods Used	Station Periods Available	Percent Use
TOTALS						

APPENDIX E: USER PERCEPTION SCALES

OUR SCHOOL BUILDING

PRINCIPALS' INVENTORY

School _____ Building _____

Grades in Building _____ Number of Teachers _____

Number of Children _____ Date _____

INSTRUCTIONS: Please circle Yes or No in response to each item below. Please make certain that your response is limited to the specific building in question.

YES NO 1. The building is a pleasant place for teachers to work.

YES NO 2. The interior of the building is most attractive.

YES NO 3. Children enjoy the use of this building.

YES NO 4. Most of my teachers would prefer to teach in this building.

YES NO 5. Teachers like this building because it is carpeted.

YES NO 6. Teachers like this building because it is airconditioned.

YES NO 7. The exterior of this building is ugly.

YES NO 8. The interior of the building is very difficult to keep clean.

YES NO 9. There should have been more windows in the building.

YES NO 10. The building is a very unsafe place.

YES NO 11. Parents think the building is very attractive.

YES NO 12. Teachers complain about the noise in the building.

YES NO 13. Teachers complain about the large open area.

YES NO 14. Some teachers won't teach in this building because of the design.

YES NO 15. Partitions could be changed very easily if necessary.

YES NO 16. The building makes team teaching easy to manage.

YES NO 17. There is always a lot of confusion in this building.

YES NO 18. Everything is always in a state of disorder in this building.

ES NO 19. The furnishings and equipment are not appropriate for the building.

ES NO 20. Parents like for their children to go to school in this building.

ES NO 21. Storage space is adequate in this building.

ES NO 22. The building is reasonably quiet.

ES NO 23. The building is pretty bad.

ES NO 24. The building gives me a comfortable feeling.

ES NO 25. The lighting is too bright and glary.

ES NO 26. The heating and air conditioning system works exceptionally well.

ES NO 27. Children can hear adequately in this building.

ES NO 28. Pupils are too crowded in this building.

ES NO 29. I like this building.

ES NO 30. The building is harsh and uninviting.

ES NO 31. Children prefer to go to school in other buildings on the campus.

ES NO 32. Children can learn better in a building of different design.

ES NO 33. This building is very much like a warehouse.

ES NO 34. Children need a better place to keep their books and things.

ES NO 35. The interior colors are most pleasant.

ES NO 36. The location of the building is good.

ES NO 37. The materials used in the exterior walls are attractive.

ES NO 38. The building is far superior to other buildings that I have managed.

ES NO 39. This building should stand for a long time with a minimum of maintenance.

ES NO 40. More visual barriers are needed to separate teachers.

ES NO 41. Audio-visual equipment is simple to use in this building.

ES NO 42. Better sound control is needed.

ES NO 43. The building gets too hot.

ES NO 44. Rearranging the space in this building is simple and relatively easy.

YES NO 45. There is adequate space for the instructional program.

YES NO 46. Scheduling teachers for this building is a pleasant task.

YES NO 47. Children feel safe and secure in this building.

YES NO 48. I think the building is very functional.

YES NO 49. The building should be remodeled.

YES NO 50. I feel this building has more good points than bad ones.

YES NO 51. Parents are opposed to the design of this building.

YES NO 52. The space in this building is better used than in most.

YES NO 53. Teachers complain about scheduling their teaching activities in this building.

YES NO 54. Teacher-pupil relationships are good in this building.

YES NO 55. Teacher planning and cooperation are better in this building than in most.

YES NO 56. Attitudes of the teachers who use this building are good.

YES NO 57. Pupils seem to learn better in this building.

YES NO 58. Community reaction to this building has been good.

YES NO 59. This building could have been better planned.

YES NO 60. Teachers should be better prepared for teaching in a building like this one.

OUR SCHOOL BUILDING

TEACHERS' INVENTORY

School_____ Teacher_____

Date_____

INSTRUCTIONS: Please circle Yes or No in response to each of the items below. As you answer each statement, think of the building and express yourself as to how the item applies to it.

YES NO 1. The noise that reaches my classroom is often disruptive.

YES NO 2. The lights are bright and glary.

YES NO 3. The building appears to be clean and sanitary most of the time.

YES NO 4. The floors seem too cold most of the time.

YES NO 5. Colors are terrible in this building.

YES NO 6. The arrangement of my room/s fits my teaching activities most of the time.

YES NO 7. This building makes me feel good about my work as a teacher.

YES NO 8. Sometimes I get concerned about what pupils are doing because this building is hard to supervise.

YES NO 9. I would like to tear this building down.

YES NO 10. This building makes me feel too closed-in for comfort.

YES NO 11. The building contributes to a feeling of security on the part of myself and my pupils.

YES NO 12. Pupils have plenty of space to work in my classroom.

YES NO 13. Toilet rooms for pupils are poorly located for convenient use.

YES NO 14. Pupils generally consider the school building to be like a jail.

YES NO 15. Adequate places are provided in the building for pupils to get together and socialize.

YES NO 16. Pupil control is very difficult in this building.

YES NO 17. This building seems to encourage better pupil attitudes toward learning.

YES NO 18. Noise control was poorly handled in this building.

YES NO 19. Writing on the chalkboard is difficult to see.

YES NO 20. The materials used on floors appear to be easily kept clean.

YES NO 21. It is always either too hot or too cold in my classroom.

YES NO 22. For the most part, interior colors contribute to a bright and cheery atmosphere.

YES NO 23. More storage is needed for my books, teaching aids and instructional materials.

YES NO 24. I believe this building helps pupils improve their feelings about themselves.

YES NO 25. I like this building because it is so easy to observe pupil activities in most areas.

YES NO 26. This building only adds to the agressive tendencies of some of our pupils.

YES NO 27. Noise and distraction in the corridor during class requires that the door be kept closed.

YES NO 28. Sometimes I feel threatened because of the way this building was planned.

YES NO 29. This building portrays a feeling of spaciousness.

YES NO 30. The library is in a good location for most pupils.

YES NO 31. Many teachers have a hostile feeling toward the building.

YES NO 32. Interaction between pupils of different races and ethnic groups is better in this building than in other buildings in which I have taught.

YES NO 33. Toilet rooms in this building breed discipline problems.

YES NO 34. Pupils appear to have more respect for this building than for others with which I am familiar.

YES NO 35. The building is unpleasant because of the noise level.

YES NO 36. The lighting system makes seeing easy for most learning tasks.

YES NO 37. Toilet rooms are dirty and smelly.

YES NO 38. Pupils appear to get drowsy and sleepy in my classroom some or most of the time.

YES NO 39. This is a beautiful building.

YES NO 40. Places are conveniently arranged for pupils' books, materials and personal items.

YES NO 41. This building contributes positively to pupils attitudes about school.

YES NO 42. I get concerned about not being able to see what is happening on the outside.

YES NO 43. Pupils like to ventilate their feelings by vandalizing this building.

YES NO 44. The school building provides adequately for the comfort of teachers.

YES NO 45. The safety of this building is questionable.

YES NO 46. The library is always crowded.

YES NO 47. The building is very convenient for most teachers.

YES NO 48. I think the building contributes to the hostility of some pupils in the school.

YES NO 49. The building seems to isolate pupils too much.

YES NO 50. Pupils appear to behave better in this building than in other buildings I know about or in which I have taught.

YES NO 51. This building appears to promote a general dislike for school.

YES NO 52. The lunchroom is a noisy place.

YES NO 53. The bright lights and the glare sometimes give me a headache.

YES NO 54. The dining room is always neat and clean.

YES NO 55. My classroom gets stuffy at times.

YES NO 56. My room/s is an attractive place.

YES NO 57. Pupil work stations are conveniently arranged for easy use and adequate teacher control.

YES NO 58. A part of my success in teaching is due to the quality of the facilities available for my use.

YES NO 59. This building causes me a great deal of anxiety because of the way it was planned.

YES NO 60. This building contributes a friendly atmosphere.

YES NO 61. The building is a very inviting and comfortable place.

YES NO 62. Pupils could get hurt easily in this this building because of unsafe conditions.

YES NO 63. The building appears to be adequate for the pupils who attend school here.

YES NO 64. The office is located too far away for convenience.

YES NO 65. A better school building could improve pupils feelings toward the school.

YES NO 66. There appears to be a lot of pupil talk between classes in the corridors.

YES NO 67. This building makes pupil control much easier.

YES NO 68. The physical environment of this school appears to involve pupils directly with the building design.

YES NO 69. The acoustics are good in this building.

YES NO 70. The lighting adds to the pleasantness of the physical environment.

YES NO 71. I don't like to use the drinking fountains because of the lack of sanitation.

YES NO 72. The building is very comfortable.

YES NO 73. Most people agree that this building is drab and ugly.

YES NO 74. Classroom management is enhanced by the way classrooms were designed.

YES NO 75. I feel comfortable when I come into this building.

YES NO 76. I believe the building causes a restlessness in my pupils.

YES NO 77. The furniture is comfortable enough.

YES NO 78. I feel safe in this building during a storm.

YES NO 79. The lunchroom is roomy and creates a feeling of spaciousness.

YES NO 80. The designer put the library in the wrong place.

YES NO 81. Some pupils get lost in the building.

YES NO 82. The building seems to have increased the involvement of pupils with each other.

YES NO 83. A better building could help the control of pupil behavior.

YES NO 84. Some pupils have exhibited behavior that appears to be protective of the appearance and condition of the building.

YES NO 85. Pupil activities create some noise but it doesn't adversely affect teaching.

YES NO 86. My classroom is easily kept clean and orderly.

YES NO 87. The overall building plan provides adequately for the educational program for this school.

YES NO 88. The building provides uninviting and unfriendly atmosphere.

YES NO 89. The playgrounds are very convenient.

YES NO 90. The building encourages orderliness and neatness.

YES NO 91. My pupils have difficulty hearing properly.

OUR SCHOOL BUILDING - I

School _____ Teacher _____

Grade _____ Date _____

Instructions: Think about your school building. Draw a circle around YES or NO for each sentence on this page.

YES NO 1. I go to school in a nice room.

YES NO 2. My classroom is bright and gay.

YES NO 3. I'd like to tear this building down.

YES NO 4. I like going to school in this building.

YES NO 5. The colors of the walls are bright and pretty.

YES NO 6. This building makes it easy for me to study.

YES NO 7. My room is just the right size.

YES NO 8. I like to play on the playground.

YES NO 9. This building makes me worry.

YES NO 10. I have a good place to put my books.

YES NO 11. This building makes my friends happy.

YES NO 12. I like to come into this building.

YES NO 13. This building is bad.

YES NO 14. This building is beautiful.

YES NO 15. My chair is too hard.

YES NO 16. I need a better place to keep my books.

YES NO 17. I like to play at this school.

YES NO 18. This building is too dark and ugly.

YES NO 19. This building gives me a good feeling.

YES NO 20. This building is really a good place to be.

OUR SCHOOL BUILDING - II

School _____ Teacher _____

Grade _____ Date _____

Instructions: Think about your school building. Draw a circle around YES or NO for each sentence on this page.

YES	NO	1.	This building makes me feel at home.
YES	NO	2.	This school is quiet.
YES	NO	3.	I like this building.
YES	NO	4.	My classroom has too many people.
YES	NO	5.	This building scares me.
YES	NO	6.	I'd like a desk that sits better.
YES	NO	7.	None of the desks are any good.
YES	NO	8.	I do not like to come to school here.
YES	NO	9.	This building is great in every way.
YES	NO	10.	I can get hurt in this building.
YES	NO	11.	I do not like this building.
YES	NO	12.	This building is really no good.
YES	NO	13.	The lights in my room help me to see better.
YES	NO	14.	The floor is too cold.
YES	NO	15.	This building is friendly.
YES	NO	16.	This building makes me feel sick at times.
YES	NO	17.	My classroom is a clean place.
YES	NO	18.	The bathroom is too far away.
YES	NO	19.	I cannot learn in this building.
YES	NO	20.	This building is too hot.

OUR SCHOOL BUILDING - III

School _____ Teacher _____

Grade _____ Date _____

INSTRUCTIONS: Please circle YES or NO in response to each of the items below. As you answer each statement, think of the building and express your opinion as it applies to it.

Yes	No	1.	My room is just the right size.
Yes	No	2.	My chair is uncomfortable.
Yes	No	3.	I need a better place to keep my books and things at school.
Yes	No	4.	This building says, "Hello, come on in."
Yes	No	5.	This building is really a good place to be.
Yes	No	6.	The lighting helps me to see better.
Yes	No	7.	This building makes it easy for me to study.
Yes	No	8.	This building makes my friends happy.
Yes	No	9.	I like going to school in this building.
Yes	No	10.	The building makes me feel restless.
Yes	No	11.	This building could cause me to get hurt easily.
Yes	No	12.	I can see to read my book and other materials easily.
Yes	No	13.	I'd like to tear this building down.
Yes	No	14.	The lunchroom is too noisy.
Yes	No	15.	The building is unpleasant most of the time.

Yes	No	16.	My classroom is bright and cheery.
Yes	No	17.	There is an awful lot of noise in this building.
Yes	No	18.	I have a good place to put my books and things at school.
Yes	No	19.	I like to play on the school grounds.
Yes	No	20.	I go to school in a nice room.
Yes	No	21.	This school is quiet.
Yes	No	22.	The colors of the walls are bright and pretty.
Yes	No	23.	This building is too dark and ugly.
Yes	No	24.	I feel lost in this building.
Yes	No	25.	I like to play at this school.
Yes	No	26.	This school building is too hot.
Yes	No	27.	This whole building is pretty bad.
Yes	No	28.	This is the best school building I have ever seen.
Yes	No	29.	I like to come into this building.
Yes	No	30.	I like to play around the building after school.
Yes	No	31.	This school building is beautiful.
Yes	No	32.	At times I feel cold in this building.
Yes	No	33.	My classroom is a cozy place to be.
Yes	No	34.	It's easy to find my classroom in this school.
Yes	No	35.	I can think of lots of ways to make the building better.

Yes	No	36.	The building gives me a good feeling.
Yes	No	37.	This building makes me feel sick at times.
Yes	No	38.	At times I feel hot in this building.
Yes	No	39.	This building could be nicer and friendlier.
Yes	No	40.	I can't hear the teacher very well.
Yes	No	41.	The building is very comfortable.
Yes	No	42.	My classroom is a clean place.
Yes	No	43.	This building is friendly and inviting.
Yes	No	44.	I get tired and sleepy in this building.
Yes	No	45.	The floor is too cold.
Yes	No	46.	This building is really no good.
Yes	No	47.	Writing on the board is hard to see.
Yes	No	48.	This building is great in every way.
Yes	No	49.	The school building makes me feel at home.
Yes	No	50.	All the desks are uncomfortable.
Yes	No	51.	I could learn better if the school were prettier.
Yes	No	52.	I'd like to have more comfortable desks.
Yes	No	53.	I dislike this building.
Yes	No	54.	I'd like to look out to see the sky, the clouds, and the sun.
Yes	No	55.	I feel too crowded in my classroom.
Yes	No	56.	This building is scary sometimes.
Yes	No	57.	The bathroom is too far away.

Yes	No	58.	This building makes me feel scared sometimes.
Yes	No	59.	I like this building.
Yes	No	60.	The lighting gives me a headache.
Yes	No	61.	This building is like a jail.
Yes	No	62.	This building isn't worth very much.
Yes	No	63.	This school building is a comfortable place to be.
Yes	No	64.	This building makes it hard for me to learn anything.
Yes	No	65.	This school building is the most comfortable place to be.
Yes	No	66.	I feel this building has more good points than bad points.

April 29, 1971
C. W. McGuffey

APPENDIX F: AVERAGE DAILY MEMBERSHIP BY GRADES AND BY SCHOOLS

F.1

CURRENT AVERAGE DAILY MEMBERSHIP BY GRADES AND BY SCHOOLS

Name of System _____ Date _____

Name of School	Elementary Grades							Middle Grades				High School Grades					GRAND TOTAL
		1	2	3	4	5	Total	6	7	8	Total	9	10	11	12	Total	

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APPENDIX G: CAPACITY/ENROLLMENT CONGRUENCE TABLE SHELL

CAPACITY/ENROLLMENT CONGRUENCE
TABLE SHELL

SCHOOL	Current Membership	Operating Capacity	Excess Capacity	Excess Membership