To the Graduate Council:

I am submitting herewith a dissertation written by William Eugene Tomlinson entitled "An Educational Planning Model to Facilitate the Systematic Interaction of Educational Decision Information." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Education, with a major in Educational Administration and Supervision.

C. Kenneth Tanner, Major Professor

We have read this dissertation
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AN EDUCATIONAL PLANNING MODEL TO FACILITATE THE SYSTEMATIC INTERACTION OF EDUCATIONAL DECISION INFORMATION

A Dissertation

Presented for the

Doctor of Education

Degree

The University of Tennessee, Knoxville

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December 1976

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ABSTRACT

The purpose of this study was to develop an educational planning model which would suggest how to bring bodies of educational decision information together so they might subsequently play meaningful roles in educational decision-making activities at the local school system level. The major factors of that model were delineated, described, and associated in a framework designed to illustrate their proposed interactive relationships.

The major factors of the Educational Decision Information Interaction Matrix were set forth as Educational Needs Assessment, Educational Program Alternative, and Educational System Accountability. The levels of these factors were developed as follows: Educational Needs Assessment--Agreed Upon Standard, Actual Situation, Discrepancy Analysis; Educational Program Alternative--System Client, Staff Competencies, Supplies/Materials/Equipment, Facilities, Special and/or Contracted Services, Parental Involvement, Community Involvement, Time, Interfacting Program Elements, Program Administration; Educational System Accountability--Objectives/Outcomes/Decision Situations/Associated Activities, Resource Allocation (Establish Requirements, Review Priorities, Determine Actual Resource Availability, Reconcile Any Variances), Evaluation (Process, Status).

The factors and levels of the model are presented in a multiple-matrix format to illustrate the complex, interactive nature of decision information in any educational setting. The proposed viability of the model is based upon the following assumptions: that students should be

a primary referent for any educational system; that continuous educational needs assessment is a necessary component for maintenance of an information base required to make sound decisions about allocating resources to support educational programs; that the multiple-matrix format of EDIIM is appropriate for bringing the components of a decision situation into perspective and illustrating the complex relationships which exist among elements of information in an educational decision situation; and that the systems theory upon which EDIIM is based insures its generalizability to various educational settings.

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CHAPTER I

THE PROBLEM AND ITS SCOPE

I. INTRODUCTION

Those members of the American populace who have any connection with the delivery of education-related services are generally disturbed about the conditions which exist relative to schools. The primary targets of the discontent are the traditional decision-makers who have influenced the operation of school systems through their administrative and managerial activities. The term accountability is being used to describe the movement which has emerged from the discontent. Constituencies are demanding to know why the results of decisions made in the 1960's, when billions of dollars were poured into education, are not measuring up to their expectations. They are growing more skeptical about the quality of decisions being made today.

The growing discontent has been evinced by court cases stemming from contention that school financing schemes are inequitable[1] and court cases stemming from concern about the direct impact which schools have on students.[2] In addition to the litigation involving school systems, early proponents of busing to achieve racial desegregation have recently altered their original positions and stated that busing has not accomplished what it was intended to accomplish. The busing issue has had a disruptive influence on many school systems in the United States. These represent three examples of the discontent referenced above.

During this period of increasing discontent, rapidly developing bodies of information which influence the structure of educational delivery systems have generated numerous problems for educational decision-makers. Problems surrounding the collection and organization of information for subsequent analysis and interpretation to be used to support studies of feasible alternative courses of action have dominated the educational scene. As a result of the problems surrounding information utilization, the actual procedures collectively called decision-making for educational enterprises remain known to the few who made decisions. The accountability issue has served notice that the various constituencies of the educational community will no longer give tacit approval to the decisions which affect educational systems. Students, parents, teachers, and principals have all voiced concern about and objected to the structure in which decisions are made by the " . . . many decision-makers who pride themselves on 'shooting from the hip,' and would not have it any other way."[3]

While the micro level referent in an educational setting is the student, major decision structures quite often function at a macro level in those areas which are critical to determining a school's capacity for impact on each student.

> For understandable reasons, the resources available to the individual learner are determined largely by budgets, program designs, and facilities and materials acquisitions made at an aggregate level. The "needs" which drive the determination of broad goals, which in turn drive program plans and budgets, are derived from summaries and aggregate characteristics of the school population. In even the most sophisticated resource centers, for example, the collection is not individualized; in even the most flexible and "modular" of scheduling systems,

student choices are constrained by available staff and facilities, rather than individual needs.[4]

Recently, some lawmakers and educators in Tennessee have recommended adoption of a scheme for the allocation of fiscal resources which proposes to use the student as the primary referent.

> Recommendation 19: Adopt the Pupil-Cost Unit Approach for Allocating to Tennessee School Systems State Funds for Financing the Foundation Program Designed to Provide Current Operating Expenditures. This method requires that each local school district classify each student as to an educational program to meet the particular student needs.[5]

The model on which the recommendation was based can be described as follows:

$$W = F\left\{\left[(X_{ij}, Y_k)\ (Z)\ (S_u)\right]\ (R)\right\}$$

Where, W = the aggregate cost per set of decision variables.

F = a functional relationship between the independent variables (X_{ij}, Y_k, Z, S_u, R) and the dependent variable W.

X_{ij} = the student population flows per school district within a state per grade level within a school district. The subscript "i" represents a particular grade level, kindergarten through twelve, within a particular local school district.

Y_k = cost differential for each student need group. Student need groups are presently represented by a kindergarten through twelve grade system.

Z = the base cost factor which is the coefficient of the unit cost differential. The base cost factor is established by the legislature based upon the availability of fiscal resources. It is expressed in dollars.

S_u = an educational delivery index based on regional disparities in the cost of living within a state.

R = a rate of inflation for providing goods and services.[6]

Regarding the components of the model as outlined above, cost differentials[7], a base cost factor[8], rate of inflation[9], and regional cost of delivery[10] have been initially addressed from a developmental standpoint. National prevalence rates were used initially to represent student population flows through various educational program categories for testing the model and providing examples of the model's capacity for generating the information which was considered necessary for resource allocation decisions at the state level.[11] However, if the individual student is to become the ultimate referent, then aggregates of student characteristics in the form of national prevalence rates cannot continue to be considered adequate representations of student needs across varying educational settings. Simply counting bodies present to be served daily in a local school district cannot continue to be considered an adequate measure of the responsibilities which a local school district has to provide educational programs. Neither average daily attendance (ADA) nor average daily membership (ADM) precisely describes the program responsibilities which a local school system has. As pointed out in a preceding discussion, constituents of schools, especially parents, are increasingly demanding to know what is specifically being done for their child in an educational context. It becomes apparent that decisions which are made using the finance model described will be unsound relative to the student referent unless specific student need information is available. That information should be developed and presented for analysis relative to a framework which integrates the various elements of an educational program with those accountability concerns which are

becoming more and more prominent. This treatise will propose such a framework.

II. THE PROBLEM

Statement of the Problem

At present, no single framework for collecting and organizing educational decision information exists which recognizes the critical role of the local school system as the primary source from which student information must emanate. The "students-in-daily-attendance" framework within which local school systems in Tennessee presently perform and report self-assessment information is not compatible with the long-range information needs at the state level to support resource allocation decisions of the nature implied by the allocation model described previously. Educational budgets are generally constructed based on last year's budget plus an amount generated by applying an increased cost factor. Local school systems could easily become satisfied with maintaining an instructional status quo while engaging in superficial change such as building new facilities or doing something to improve instructional programs only when categorical funds become available through a special funding source. As noted previously, the impact of resource allocation decisions appears to far outweigh the impact of program decisions. As a result of that decision imbalance, local school systems are generally forced to "plan" along a money to student continuum rather than a more desirable student to money continuum.

In view of the possible incompatibilities between the locally determined operational objectives of local school systems and the forced objectives brought about by resource allocation decisions at the state level, it appears imperative that local school systems be provided guidance in accurately and precisely describing their particular educational situations. Such detailed descriptions would facilitate establishing a basis for increasing their influence on state level fiscal resource allocation decisions about support of educational programs at the local level. The proposed implementation of a new finance model for Tennessee which explicitly recognizes the individual student as its primary referent can become a reality only when student-program-cost information is routinely available that accurately and precisely represents those educational programs which are necessary to serve students across the various communities of the state. However, local school systems lack a systematic framework which can be utilized as a guide for associating student needs with program development, program objectives, program activities, the resources necessary to support a program alternative, the availability of those required resources, and an evaluation of the degree of effectiveness with which any program is delivered. There is no comprehensive educational planning model which helps interrelate local school system educational needs assessment, educational program alternative development, and educational system accountability factors.

Purpose of the Treatise

The purpose of this treatise is to present an educational planning model which will suggest how to bring bodies of educational decision

information together so they might subsequently play meaningful roles in educational decision-making activities at the local school system level. The major factors of that model will be delineated, described, and associated in a framework designed to illustrate their proposed interactive relationships. An application of the model would be expected to facilitate a change in educational planning strategy from a money-to-student orientation to a student-to-money orientation.

Significance of the Study

Based on a trend in American educational settings toward recognizing the student as the referent for both program planning activities and subsequent resource allocation activities, a need has presented itself to close a gap between the information orientation necessary to support a student referent system and the present "status quo" oriented information development system in Tennessee. Efforts must be targeted at establishing some direction for facilitating assessment at the local school system level. Self-examination by each local school system will be a necessary first step in the construction of any information base which is intended to support decision-making activities that have the student as a primary referent.

The finance model component represented as X_{ij} makes the information setting forth each school district's pupil population by pupil need categories a critical concern at that point in time when implementation actually occurs. That concern will be critical both from political and equal educational opportunity standpoints. Without specific

student need information on a timely basis any state level resource allocation decision based on the proposed finance model would perpetuate the existence of a system which on the surface appeared to be student need referenced but was actually bodies-employed, previous-budget-revision, and politically oriented. Literature regarding the subject of providing information for decision-making strongly suggests that the most critical step is establishing the appropriate framework within which to operate relative to the decision situation at hand.[12] This treatise will provide direction for establishing such a framework relative to the student need reference point. Such an orientation is considered absolutely necessary for any successful transition from the present money-to-student orientation to a student-to-money orientation.

III. LIMITATIONS AND DELIMITATIONS

1. The study was developmental in nature.

2. The study was limited to the development of a model to be used as a guide by local school systems but was not tested over a sample of local school systems to establish its practical validity. Its validity will be proposed relative to the theoretical bases from which it was generated.

3. No specific regard was given to economic efficiency while considering the steps necessary to support the model concept.

4. The availability of personnel who are trained to utilize a system approach is a limiting factor to immediate widespread utilization of the model to be presented.

5. Immediate access to supporting technological developments for data processing, storage, and reporting is considered a limiting factor to immediate, widespread utilization of the model presented.

6. Full development and implementation of the model would require a multi-disciplinary team of technical and educational specialists.

IV. ASSUMPTIONS

The proposed model was developed based upon the following assumptions:

1. Student needs relative to community values for various educational outcomes are diverse enough across educational settings to warrant the effort required for by-school-system assessment of student conditions.

2. A system approach to assessment is generalizable across educational settings and problems.

3. Educational systems should become marginally accountable for their efforts to effectively provide educational programs to students.

4. The student is the most appropriate unit against which to measure attainment of marginal accountability. The individual student should be the most elemental referent to be used as a unit of accountability in a local school setting.

5. The proposed model format is appropriate for bringing the components of a decision situation into perspective and illustrating the complex relationships which exist among elements of information in a decision situation.

6. Local school systems will find extensive use for a specific framework within which to develop information about their system.

7. The effectiveness of any system or its components cannot be measured unless the criteria for effectiveness are established relative to the specific setting in which system operation will occur.

8. An educational accountability system which uses students as its primary referent must first be developed for local school system application. More aggregate accountability measures can be developed for application at state, regional or national levels if a basic system exists at the local level.

9. Given an appropriate framework for activity and necessary pre-service training for its operatives, a local school system can make the best determination of the needs of its students.

10. Educational programs have some common major elements which can be systematically grouped for consideration during all phases of formulating an educational program delivery strategy from goal and objective establishment through operation, system evaluation and alteration as necessary.

11. Given an understanding of the system approach to local school system educational needs assessment, there is a greater degree of assurance that an educational program will be more correctly selected and more properly implemented utilizing a system approach than with any other alternative.

12. A valid needs assessment can be conducted at the local school system level against varying standards across settings.

13. The actual dollar amount budgeted should be the last step accomplished by a local school system in formulating an educational program delivery scheme.

V. DEFINITION OF TERMS

The following terminology is employed throughout this treatise and is defined below to insure clarity and continuity for the reader.

Accountability. "In oversimplified form, the idea [of accountability] is to hold schools answerable for their students' learning outcomes."[13]

A basic tenet which was adhered to in this treatise is that holding a system accountable implies that it was established a priori, what was to be done, why, when, where, and how "it" was to be done, and additionally, who was responsible for getting it done and in what environmental situation it was being done.

Marginal Accountability. Marginal will be construed as the last pupil unit of learning activity supported in a defined educational setting (or last learning program supported); program analysis can also be marginal. Marginality is relative to the unit of analysis. Accountability will be construed as previously indicated.

Decision. "A decision is a choice among alternatives."[14]

Decision-Maker. The person or group exercising judgment in a decision situation. In the context in which this treatise is presented, a decision-maker can be a student, parent, teacher, principal, supervisor, superintendent, school board member, or depending on the situation, several other decision-makers could be considered possible.

Decision Situation. "A decision situation is a set of alternatives."[15]

Need. "An educational need is defined as the measurable discrepancy (or gap) between current outcomes and desired or required outcomes."[16]

Needs Assessment. " . . . To have a need we must identify and document that there is a gap between two outcomes, that which is currently resulting and that which should be resulting. The setting of the two polar dimensions of a need should be done in a formal way, and such a procedure is called 'needs assessment'."[17]

Program. "The sum total of parts working independently and working together to achieve required results or outcomes, based on needs."[18]

For the purpose of this treatise "program" will be an educational program and will be considered to have the following inventory of elements:

1. students or learners
2. staff competencies
3. supplies, materials and equipment
4. physical facilities
5. parental involvement
6. community involvement
7. special services (including contracted services for program development)
8. time
9. interfacing program elements
10. program administration

Specificity. "By specificity we refer to two factors: (1) the most elemental use to which information is ever likely to be put, and (2) the capacity of a user system to develop suitable information

bases."[19] The degree of specificity required is considered to be defined primarily by the situation of the user.

Timeliness.

> Timeliness is associated with the nature of the demand for data. If the demand is immediate and the information delivery system has not yet been highly developed, obviously, the timeliness criterion cannot be met. Timeliness, therefore, is to some extent a function of the stage of development of an information delivery system . . . . Therefore, when judging a model, decision-makers must be aware not only of its capacity to provide the information required for decision-making, but of the conditions under which it will be forced to operate. Unrealistic expectations will only lead to disappointment. Good communication between the most elementary level decision-maker and the system analyst is essential.[20]

These statements are considered to set forth the parameters for attaining the condition of timeliness. Another, more succinctly stated condition for timeliness in the decision situation can be provided in question form. "Is the information available when the decision-maker requires it?"[21]

System. The sum total of parts working independently and working together to achieve required results or outcomes, based on needs.

> For example, a school could be a system (if it has objectives), a school district could be a system, and an instructional program could also be a system. According to this particular definition, if an entity has purpose and organization, it can be a system.[22]

System Analysis. "System analysis . . . consists of a set of planning tools that tells what is to be done to meet identified and documented needs. . . ."

"At the completion of system analysis, the planner has identified all of the feasible 'whats' for problem solution, and he knows the possible ways and means for achieving each 'what'."

"The usefulness of any system analysis lies in (1) the validity of the data it uses and (2) the objectivity and integrity of the planner."[23]

Systems Analysis.

> The technique of systems analysis as defined by Cleland and King (1968) is different from the definition of systems analysis as described in previous chapters (cf. Kaufman, 1970). Cleland and King define this tool as:
>
> 1. Systematic examination and comparison of those alternative actions which are related to the accomplishment of desired objectives.
>
> 2. Comparison of alternatives on the basis of the resource cost and the benefit associated with each alternative.
>
> 3. Explicit consideration of uncertainty.
>
> Conceived in this manner, systems analysis is most useful when we have in fact identified objectives and requirements based on needs and are ready to locate and consider possible alternative methods and means. Thus conceived, systems analysis would be most advantageously applied after the completion of educational system planning, and thus when objectives have been derived from a needs assessment and system analysis.[24]

Systems Approach.

> A process by which needs are identified, problems are selected, requirements for problem solution are identified, solutions are selected from alternatives, methods and means are obtained and implemented, results are evaluated, and required revisions to all or part of the system are made so that the needs are eliminated.[25]

VI. ORGANIZATION OF THE STUDY

This treatise is presented in four major parts. Each of the four chapters presents the content outlined below.

Chapter I. A statement of the problem being addressed; a statement of the purpose of the study; a discussion of the significance

of the study; the limitations and delimitations of the developmental process accomplished and the product of that process; the assumption upon which the developmental process was based; and definitions of important terms.

Chapter II. A review of the developmental concepts employed; statements about modeling concepts and their application; a statement setting forth a rationale for the model; an explanation of the proposed model.

Chapter III. Guidelines for developing the proposed model in a local educational setting; delineation of information requirements for implementing proposed model concepts; presentation of recommendations regarding critical aspects of model utilizations.

Chapter IV. A presentation of the summary, conclusions and recommendations emerging from the efforts of the developmental process accomplished.

CHAPTER II

THE MODEL

I. REVIEW OF THE DEVELOPMENTAL PROCESS

A Framework for Development

A framework for the study was selected based upon an outline which was designed to serve as a guide for developing and testing educational planning models. The first section of that guide provided a choice from the following developmental alternatives:

1. create your own model
2. design based upon someone else's theory
3. replicate a study.[26]

Alternative 2 was selected and development was based upon system analysis theory, evolving educational system planning techniques and methodologies, and evolving evaluation concepts related to needs assessment, program development, and accountability issues. A system approach was selected as a viable, generalizable concept for coping with the complexities of decision-making at any level within a gigantic enterprise such as education. A system approach provides a conceptual basis for dealing with the needs and problems of each unique subsystem which might be delineated within a major system. The most basic model emerging from system theory is the "input-conversion or process-output" model.[27] An assumption is made that any application of the system approach should utilize the basic functions of analysis, regarding information processing during decision-making, that are outlined in Figure 2.1. However, any

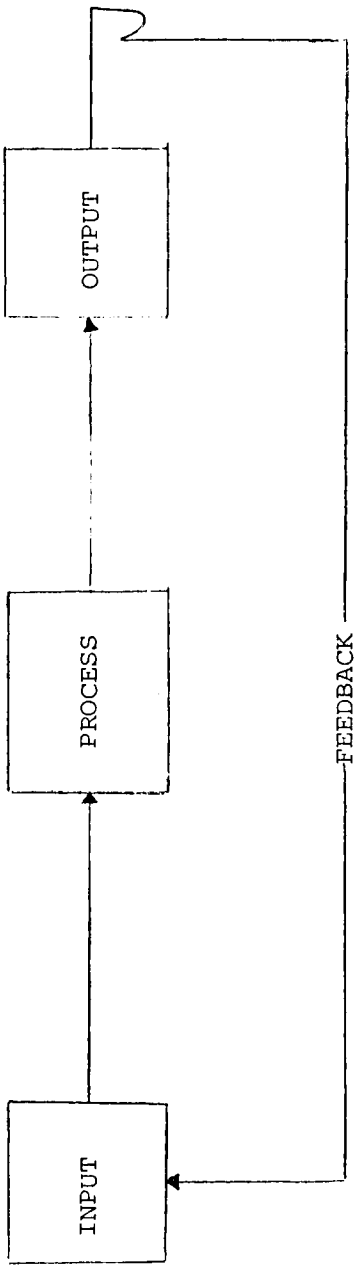


Figure 2.1. Basic System Concept

assumption that decision-makers normally follow a rational model would not be warranted. As Egon Guba has stated:

> Most treatises on the subject of decision making view the process as essentially rational: the decision-maker starts with some awareness of a problem which he must resolve; he then assembles alternative ways of responding to that problem; he chooses from among the alternative responses that one which, on balance, appears to have the highest success probability, and then he implements the choice.
>
> But it seems highly unlikely that real-world decisions are in fact made in these ways. The mere creation of awareness of the need for a decision is a formidable task; many decision-makers seem to prefer not to be made aware unless absolutely necessary. Generally speaking, the range of possible responses available to the decision-maker is not very large; if even one alternative exists, the decision-maker is usually delighted. The choice among alternatives is not usually made on the basis of explicit and well-understood criteria; and many decision-makers pride themselves on "shooting from the hip," and would not have it any other way.[28]

In working to develop a model to facilitate the ordering of information utilized in decision-making activity, and ultimately to provide for accountability throughout a decision-making process, a sound theoretical structure was necessary. Regarding the basic system concept, "input" can be initial or basic information received by a decision-maker. While "process" is that period of activity engaged in for the purpose of attaching value or meaning to the input received. Resulting decisions could be considered "output." Those decisions can become input for some other system, and thereby evoke response in the form of processing and decisions as output. In keeping with the cyclical model illustrated in Figure 2.1 (p. 17), the output can become new input to a former decision-maker in a system, and therefore, called feedback; or it could become new input for an entirely different system.

Expanding on the basic system model, it is possible to illustrate an educational system planning model which has six steps.[29] Those six steps are (1) identify problems based on a needs assessment; (2) determine solution requirements and solution alternatives; (3) select solution strategies from among alternatives; (4) implement the selected alternative; (5) determine performance effectiveness; and (6) revise the system as required. Figure 2.2 illustrates the model just outlined.

Further development and expansion from the concepts set forth by Figure 2.2 makes it possible to formulate a scheme such as that illustrated by Figure 2.3.[30] It can readily be seen that the expansion of the problem-solving model uses its six components as the basis for the model developed in Figure 2.3. The needs assessment component is consistent with Kaufman's approach called discrepancy analysis.[31] That concept posits that needs should be expressed by some valid, reliable measures of condition regarding the educational setting being scrutinized and should be set against statements concerning desired or expected conditions. Any measurable difference defines a gap and a statement of needs. Refinements of the statement of needs should specify problem areas which prevent the needs from being met. Determination of solution requirements tells what is to be done but not how to do it. Attendant to that activity is an identification of solution or program alternatives. Such activity provides for an identification of alternate approaches or combination of program elements that is expected to make a contribution to the next phase, implementation. Elements of a proposed program should be related to costs which are expected to be incurred if a

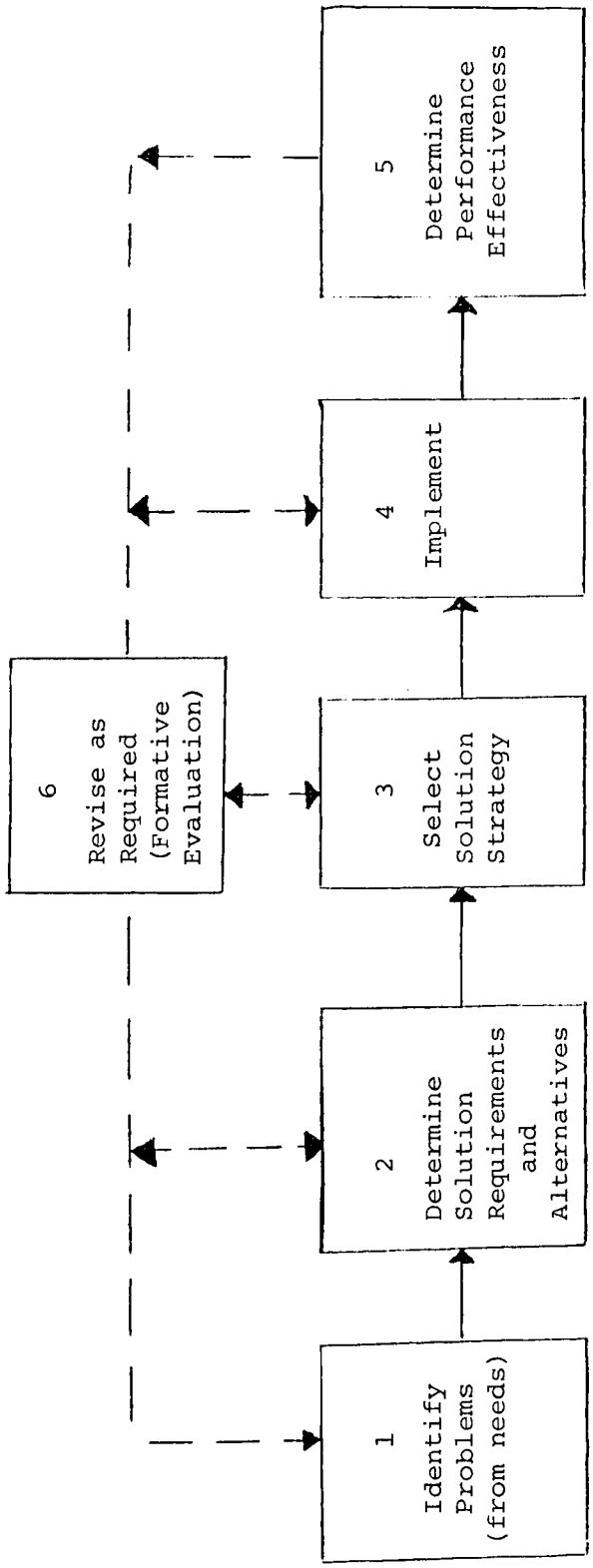


Figure 2.2. A Problem-Solving Process Model

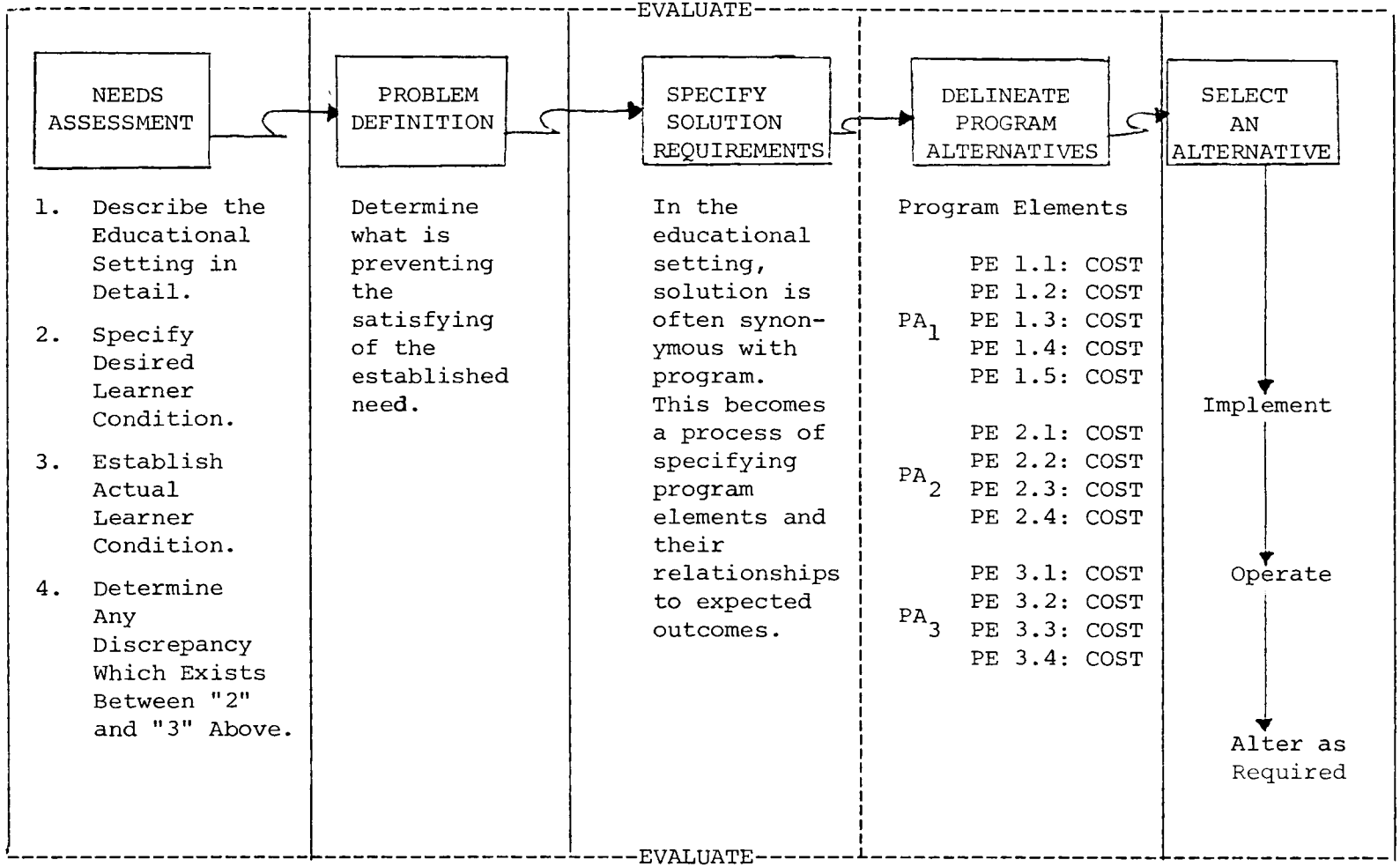


Figure 2.3 Expansion of the Problem-Solving Process Model

specified combination of elements (called a program or solution) is chosen. Implementation and operation are administrative and management functions. Once a program has been specified for utilization in a particular educational setting, the program elements and educational setting must be brought together before any expected outcomes can occur. Two types of feedback must be provided for such a system if it is to remain viable. One form is termed "formative evaluation"[32] and is conducted during operational activity to facilitate altering procedures as necessary. The second is termed "summative evaluation"[33] and is carried out to determine specific status relative to some expected outcome at a point in time.

Harry Hartley succinctly stated the concept of system analysis when he wrote that it " . . . provides a basis for the intensive study of complex phenomena that are in some way related within the defined boundaries of a unified system."[34]

Modeling Concepts, Problems, Types and Evaluation

Once a framework had been selected within which to develop a model, a review of modeling concepts was conducted. Each concept presented below variously influenced the final disposition of the model to be presented in this chapter. A specific framework was used for comparison of the many concepts encountered and is presented in Figure 2.4.

Statements included about a "modeling concept" provide definitions or operational descriptions of an idea about "modeling" or a "model." Most concepts have attendant "problems." Many of those problems can be

Modeling Concept	Associated Problems	Types of Models	Evaluation of a Model

Figure 2.4. Framework for Comparison of Various Modeling Concepts

considered generally applicable to any modeling effort. Specific "types" of models have been developed relative to the various concepts of "modeling." Those which are considered to have relevance to the forthcoming discussions are presented in the sections which follow. Finally, some items are included under the heading "evaluation" to facilitate a subsequent determination of the usefulness of a model which has been proposed. The words of the authors of the various thoughts presented below are used in order to express those thoughts as accurately as possible.

Modeling Concepts

> A. In everyday language the term model has at least three different usages. As a noun, model implies a representation; as an adjective, model implies ideal; as a verb, to model means to demonstrate. We are aware that when we refer to a model railroad or a model husband we use the term in different senses . . . .

In model building we create an idealized representation of reality in order to demonstrate certain of its properties. "Once this definition is given, models can then be easily classified by various objectives and functions that they are designed to serve."[35]

> B. . . . (Correa 1967b) I have defined a model as (1) a set of variables classified as endogenous and exogenous; (2) the cause-effect relationships among these variables; and (3) the consistency of these relationships. By "consistency" I mean that, whenever the values of the exogenous variables are specified, the values of the endogenous variables can be determined in one and only one way. This definition can be extended to include stochastic models, in which case the values of the exogenous variables specify only a probability distribution of the values of the endogenous variables. Models are attempts to "explain" the phenomena characterized by the endogenous variables. By definition, a phenomenon is explained when a model of it is constructed, that is, when the values of its endogenous variables can be determined, given those of the exogenous variables.[36]

Problems Associated with Modeling and the Use of Models

A. Correa recently noted that one major reason why educational administrators and planners have been reluctant to utilize formal models in their planning and policy analysis rests with the model builders who have been busy constructing models instead of explaining what models are and how they can be properly integrated into existing planning designs. This same problem was mentioned in the November, 1967, U.S. Office of Education Conference in Operations Analysis when the serious inability of educators and model builders to effectively communicate with each other was one of the major concerns of the conference.[37]

B. One major reason why an innovation such as decision modeling is not more widely accepted by educators is that those who would use it often do not fully understand or appreciate the unanticipated consequences that follow from its utilization. Decision modeling, based largely on the systems orientation, is quite contrary to what might be called a "natural" inclination of managers which is to cut very complex problems "down to size" and isolate each one from its environment. Specifically, we tend to eliminate aspects of the problems which make it difficult to solve or immediately reduce it to one that can be handled by standard techniques.

A decision model, on the other hand, moves in the opposite direction. It deliberately expands and complicates the statement of the problem until all the significant interacting components, hopefully, are contained within the conceptual scheme. Hence, decision models, when implemented often tend not only to identify but also to threaten members within an organization who have a "vested interest in obscurity."[38]

C. Perhaps the most important consideration is at what level--macro or micro--shall the data of the plan be assembled. The macro level deals with statistics of mass behavior and their properties . . . . Micro models require that the educational planner's preference system be specified in considerable detail. Preparing such detailed specifications is frustrating and, to date, still operationally crude.[39]

D. If one possesses complete information on the needs of the learner and the resources available, a perfect educational model is simple enough. However, the educational modeler is

faced with subtly differentiated individual behaviors, imperfections in communication--e.g., poorly trained teachers or lack of a specific and required resource--and inequities among the various educational decision-makers who are all on the same team.[40]

E. A . . . model begins at one time and is carried forward to a new time, t + n. The way the time dimension is conceived is a matter of considerable significance. One major consideration is how often results are required. Another consideration is the response lag among the variables, and yet another, the educational planner's perception of the self-equilibrating features of the model. Such features represent equilibrium relationships between exogenous (variables outside of the model, but influencing its operation) and endogenous variables (variables within the model). Without self-equilibrating properties, the plan's systems could fluctuate cyclically, explode or degenerate.[41]

Types of Models

A. Churchman, Ackoff and Arnoff classify models as follows: Iconic, Analogue, and Symbolic. Roughly, we can say that (1) an iconic model pictorially or visually represents certain aspects of a system (as does a photograph or a model airplane); (2) an analogue model employs one set of properties which the system being studied possesses (e.g., for certain purposes the flow of water through pipes may be taken as an analogue of the flow of electricity in wires); and (3) a symbolic model is one which employs symbols to designate properties of the system under study (by means of a mathematical equation or set of such equations) . . . .

Science employs all three types of models. In general, iconic and analogue models are used in preliminary phases which precede the development and symbolic models . . . . It should be clear that models and mathematics are not synonymous terms. Excellent examples of this point are the models developed in State Education Agency planning and those developed for educational project management.[42]

B. Since educational planning should result in decision-making, policy formation, and a guide for future action, it seems appropriate that the general form of the decision model used in policy

analysis and operations research be explained in some detail. A decision model is a mathematical model with two essential characteristics. First, at least one of the "input" variables is subject to control by a decision-maker, i.e., more than one alternative course of action is available. Second, the "output" variable must be a measure of the value of the alternative choices to the decision-maker.

Ackoff has noted that decision models should take the following form:

$$V = F\ (X_i, Y_j)$$

where V = the measure of the value of the decision that is made (i.e., the action taken).

X_i = the variables which are subject to control by the decision-maker; the decision variables define the alternative courses of action.

Y_j = the factors (variable or constant) which affect performance but which are not subject to control by the decision-maker within the scope of the problem as defined; these we shall call "parameters."

F = the functional relationship between the independent variables and constants, X_i and Y_j, and the dependent variable V.

In some problem situations the values of the decision variables are constrained or limited. Decision models are usually considerably more complex than the straight-forward model presented above.[43]

C. Three major types of simulation models can be identified. They are: continuously changing models (analogue simulation), fixed-period models, and discrete-event models.

In the continuously changing model, the set of variables is changing continuously with time. This model represents such systems as the electro-mechanical forces. In the fixed-period model, time is broken up into a set of finite periods, and the variables are allowed to change only at the ends of the periods. The variables are continuous quantities whose change is specified by a set of difference equations, for example. The model is used in work such as econometrics, when data are available only on a periodic basis. The discrete-event model's variables are discrete quantities representing states of the entities in

the system. Interactions among the entities take place only at discrete points in time and are known as events. Time advances from one event to the next, and all changes in the system are made at that time. This model can be applied to a wide range of problems such as the queuing up of students in lunch lines, movement systems, and the interactions of various educational activities.[44]

D. An integral part of any discussion related to decision-making is the concept of knowledge utilization.

Three Models of Knowledge Utilization.

In 1966 (Havelock) undertook a three-year review of literature to find out what scholars, researchers and practitioners had to say about dissemination and utilization. Havelock looked at several hundred studies from a number of fields; not just from education but also from medicine, agriculture, industrial technology and so forth. From this review he concluded that there are three main models or orientations which are used to describe the utilization process. Each of these is valid in a different way but each represents a special perspective. He labeled them as follows:

1. The Research, Development and Diffusion Model (RD & D)
2. The Social Interaction Model
3. The Problem-Solving Model.[45]

E. The distinction between models in education and models in educational planning and administration appears at first glance to be clear. The main objective of the former is to explain educational variables, for example, why students learn or do not learn, and how the interests and preferences of society, parents, and children influence the educational process. Models in planning and administration attempt to specify the requirements that must be met in order to achieve efficiently specific targets. The key word in this definition is "efficiently." Targets should be achieved without waste of resources. In order to do this the cause effect relationships between resources and targets (i.e., between inputs and outputs) have to be known. In other words, scientific models form the basis for planning and administration models.

> . . . A model is purely scientific when, on the basis of an assumption of rationality, it describes how people behave. A model for planning specifies what people ought to do in order to behave rationally.
>
> . . . Those models that seem more oriented toward explanation are considered educational models, while those that specify what should be done to achieve goals efficiently are classified as planning models.[46]

The model to be presented is a planning model.

Evaluation of Models

A. The following criteria in the form of questions should provide the reader with sufficient insight not only to interpret and evaluate the models reported in the literature but also to assess the relative utility of models that might be proposed in connection with his own planning and policy analysis.

1. What is the single system to be modeled?
2. Should a unique model be built for each subsystem?
3. Who are the decision-makers?
   What assumptions are made about the decision-maker who would use the model?
4. Who is responsible for the generation of alternatives?
   How are they developed and by what criteria are they compared?
5. What are the goals, overall objectives or targets involved?
   What is their purpose?
6. Are priorities or weights involved?
   What is their purpose?
7. Are performance and effectiveness involved?
   How are these concepts defined and how are they measured?
8. What is the pertinent time span for the construction of the model as well as for its implementation once it can be validated?
9. What supportive information systems are required for the model?
10. What are the controllable variables?
    (For which decision-makers?)
11. What are the uncontrollable variables?
    (For which decision-makers?)
12. Can multiple criteria be translated to a single figure of merit?
    Does the concept of optimization vanish without a single criterion?
13. How would you implement the model in its intended environment?

Are costs of translating an ideal model to a workable model in the real world prohibitive?

14. How would you teach people to do the things that the model asks people to do?

While this list of questions is not exhaustive it is, on the other hand, sufficient to illustrate the types of considerations that must be included when models are to be judged as to their contribution toward solving real and immediate problems faced by educational planners.[47]

Since a focus of this treatise is providing a framework in which to develop information for decision-making, some considerations about assessing the adequacy of information generating activities are provided. Stated simply, evaluation is the science of providing information for decision-making.

The methodology of evaluation includes four functions: collection, organization, analysis and reporting of information. Criteria for assessing the adequacy of evaluations include validity (is the information what the decision-maker needs?), reliability (is the information reproducible?), timeliness (is the information available when the decision-maker needs it?), pervasiveness (does the information reach all decision-makers who need it?), and credibility (is the information trusted by the decision-maker and those he must serve?).[48]

Rationale for Developing the Model Presented in This Study

Instructional and funding concepts which have emerged in today's educational settings emphasize the individuality of learners' needs as a critical concern when establishing future direction for educational programs. Contemporary instructional approaches and their adjuncts all contribute to the concept of individualizing to meet the specific needs of learners.[49] Funding models, such as the one recently proposed in Tennessee,[50] implicitly recognize the varying needs and situations of learners. The systems which serve to provide for individual educational

requirements have become multifaceted conglomerates of programs and support mechanisms. However, no practical framework seems to be available to local school system personnel within which to study a system's components in order to provide the timely, specific information which is preferred by decision-makers. Based upon this presumed preference, the following additional assumption is made and serves as the basis of a rationale for the model to be presented: if a decision-maker can gain order when formulating his decision alternatives, then he will opt for the more ordered decision framework in which to function.[51] Such action on the part of educational decision-makers would help alleviate a primary problem associated with the accountability issue; that is, for what is the decision-maker being held accountable? The primary inquiry being posited is "how does an educational decision-maker gain order in the decision-making situation?" This treatise will propose a response to that inquiry.

Another consideration relative to the rationale for developing the proposed model can be stated as follows: decision-making is situational in its nature; and although each situation may appear substantially similar at an aggregate level, the interactions of the components of that substance change across systems.[52] The only somewhat static feature may be an inventory of components across situations. The constantly varying degree to which each component or its elements impact on a situation provides for the dynamic characteristics of a decision-making situation. Therefore, the two primary considerations in the rationale are gaining order in the decision situation; and the situational nature of decision-making.

Summary

Modeling should produce some kind of "representation" of a system or one of its components. Attempts should be made to construct the representation as accurately as possible. Steps should be taken to insure that the information specified as necessary to support application of a model is generated or extracted from sources which are reliable and compatible with the intended use of that information. The various types of models range from very tightly constructed, straightforward mathematical models to extremely complex and "rambling" decision models. The two types of models which most closely identify with the concepts to be set forth in this treatise are Havelock's problem-solving model and the specification by Correa of "models in educational planning and administration." The problems related to communicating the concepts of the proposed model, to specifying the sources and nature of the information to be used, to selecting an appropriate system level at which to propose application of the model, and to determining an appropriate schedule for facilitating interaction of the model's components were all common to the development of the model addressed here. Evaluation of the model is presented in Chapter IV.

II. PRESENTATION OF THE MODEL

The model developed in this study has three primary factors: educational needs assessment; educational program alternative; and educational system accountability. These factors are not new on the educational scene;[53] however, no configuration of those factors, as set forth by this treatise, was encountered during this study. Each of

the factors was discovered in its own developmental context, but none was found in a presentation which proffered the precise interactions to be suggested by the Educational Decision Information Interaction Matrix (EDIIM)[54] which is presented on the following pages.

Figure 2.3 (p.21) provided a process model which suggests certain activities to the decision-maker in which he and his associates could engage themselves in an educational setting to produce an accountable educational system. But, it only "suggests" a framework which might be further defined; and further definition might not result in sound operational definition or subsequently effective employment because of the aggregate level of technical capability of a local school system's personnel. That process model is, additionally, misleadingly simplistic in appearance. The EDIIM model described by Figures 2.5 and 2.6 not only represents an expansion of the illustration in Figure 2.3 (p. 21), but also, places the information under consideration in an interactive analytical framework rather than the less definitive, linear process, flow-chart configuration. As pointed out earlier in the discussion of problems associated with developing and using models, McNamara indicates that:

> A decision model . . . deliberately expands and complicates the statement of the problem until all the significant interacting components, hopefully, are contained within the conceptual scheme.[55]

The Form of the Model

Each of the three factors identified above as primary considerations in the model concept is represented as a marginal dimension on the

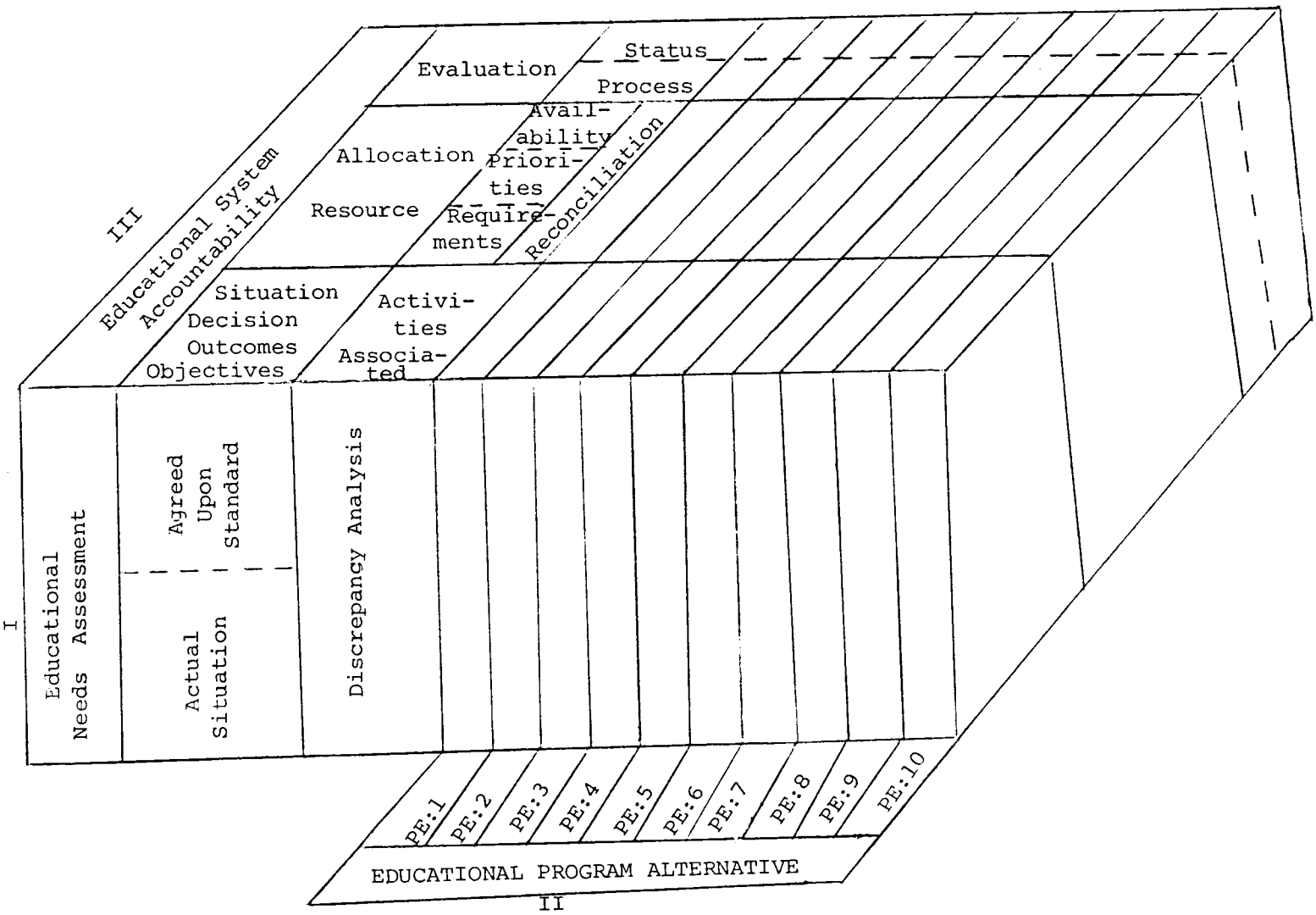


Figure 2.5. Educational Decision Information Interaction Matrix (EDIIM): An Educational Planning Model

I. NEEDS ASSESSMENT

A. Establish an agreed upon standard.
B. Determine the actual situation (relative to the agreed upon standard).
C. Determine if any discrepancy exists between the situations described through the activity of A and B.

II. EDUCATIONAL PROGRAM ALTERNATIVE

A. Program Element (PE i.1): System Client (Student)
B. Program Element (PE i.2): Staff Competencies
C. Program Element (PE i.3): Supplies, Materials, and Equipment
D. Program Element (PE i.4): Facilities
E. Program Element (PE i.5): Special and/or Contracted Services
F. Program Element (PE i.6): Parental Involvement
G. Program Element (PE i.7): Community Involvement
H. Program Element (PE i.8): Time
I. Program Element (PE i.9): Interfacing Program Elements
J. Program Element (PE i.10): Program Administration

III. EDUCATIONAL SYSTEM ACCOUNTABILITY

A. Objectives, outcomes, decision situation, and associated activity statements
B. Resource allocation:

1. Establish requirements
2. Review priorities
3. Determine actual resource availability
4. Reconcile any variances among 1, 2, and 3

C. Evaluation:

1. Process
2. Status:

a. Planning
b. Development
c. Implementation
d. Installation

3. Terminal or product

Figure 2.6. A Presentation of the Factors, Levels, and Elements of the EDIIM Model

array in Figure 2.5 (p. 34). Each major factor is then further delineated according to its various levels and elements.

Educational Needs Assessment

As shown by both Figure 2.5 and 2.6, (pp. 34 and 35), needs assessment is broken down into three levels. The first level is described as "Agreed Upon Standard." This level should be addressed first. When measuring anything a rule or standard must exist or there is no basis for making comparative statements about the condition or situation of particular interest. Some benchmark must be available against which to set the actual characteristics that describe an educational setting and its constituencies. The terminology "agreed upon" is considered extremely crucial. When rules or standards are established without agreement on the part of representatives of various constituencies, then eventually, some form of conflict can be expected to develop.[56] Many alternatives can exist for consideration as an agreed upon system standard. The standards should be established across all program elements, and should be especially designed for the clients of an educational system.

Secondly, the "actual situation" must be described with as much precision and accuracy as possible. This is usually the responsibility of professional staff members. Professionals have studied and trained to provide such service to an educational system. The professional may call upon others to assist or provide information but should be given primary responsibility for a description of the actual situation. For consistency, the actual situation should be described in terms which are

like those used to state the agreed upon standard. Without this consistency, the next level of assessment cannot be properly accomplished.

Thirdly, a determination must be made regarding the existence of any discrepancy between the agreed upon standard and the actual situation. Some appraisal must also be made of the criticalness of any discrepancy that exists. This is done so that later in the decision process, when resource allocation is of concern, decision-makers can opt for satisfying system needs on a priority basis.

Statements should result from the assessment process which can be utilized to guide development and exploration among educational program alternatives. These statements should specifically identify the students to be served by a program and should describe the educational setting in which they function. The statements should also reflect the sources of their substance. Whether the sources are personal judgment or a result of applying sophisticated analytical methods, without knowledge of them, the professionals will be charged with developing program alternatives for consideration cannot accomplish their tasks properly. It would be similar to trying to play a game without knowing the rules. In this game it is also important to know who worked together to make the rules.

Educational Program Alternative

Each program alternative to be considered can be divided into ten elements. The elements are represented by the letters "PE" and a two-part subscript consisting of the letter "i" representing any specific program alternative from 1 to n and a number representing a specific element from one to ten.

Program element number one, the "system client," should be the primary referent for making decisions about the nature of a local school system's daily activity. The student should remain the primary concern throughout an entire program development and delivery process. Objectives should be specified for student performance; or conditions of students should be targeted for alteration; or questions should be posited about the direction of student activity; or events should be identified for occurrence; or expected situations should be described in detail so that decisions about program direction can be planned as much in advance as possible. Resource allocation and program effectiveness should be determined using the student as the unit of analysis. Unless specifications for attaining certain outcomes or altering certain conditions are established a priori, then programs will most likely be administered on an impromptu basis and no one, especially students, will know what is expected to result from having spent time in an educational program. The student is selected as the primary referent because he/she is the major input variable for any educational system. As a variable in the model, decision-makers have no control over the condition of the student when he/she initially enters a system. Nevertheless, decision-makers in an educational system do have a major responsibility for the impact that an educational system has on a student while he/she is a client. The nature of a student as an input variable should be alterable relative to an educational system's programs over time. This alteration process should not necessarily be controllable, but should become somewhat predictable. The student should be allowed to maintain individuality,

but some common ground for interaction should come into being as a client and a system become more familiar with each other. The breadth of student needs for programs can also be related to numbers of students to be served in a system.

Program element number two is termed "staff competencies." If an educational system is to plan and direct learning activities on as individual a basis as is feasible, then persons with certain competencies will comprise a required element of almost every program. The mix of competencies represented on the staff of an educational system has simply evolved in many instances.

If planning for educational programs is accomplished in the context proposed by EDIIM, the mix of required competencies must be studied thoroughly in order that future staff development activity and hiring can be soundly planned. A program cannot be delivered effectively if the level of staff competency to work in the targeted area of client development is incompatible with the established demands of program direction.[57]

Staff competency levels constitute another variable over which local school systems have relatively little initial control. A system's teachers bring varying personalities which have gone through varying higher education programs guided by professors with divergent philosophies and biases toward theories and concepts about learning and approaches to teaching. All of this is supposedly brought together by minimum qualification requirements for certification at the state level and the screening processes which local systems develop. Nevertheless, competency levels

vary widely and staff development has primarily remained a personal responsibility of the professional. The mix of staff competency levels has often been even less coordinated than the mix of student activities supposedly leading to a functional achievement level after twelve years of formal schooling. The patterns of staffing competencies have often emerged more by chance than by design. If a system is to become accountable, these patterns must be planned. If required competencies do not exist among staff members, then development must be planned or provisions made to add those competencies in the form of new staff members. If students are the referent for planning system activity and the outcomes being sought indicate that certain activities are appropriate to facilitate attainment of those outcomes, but the system's professional staff members do not have the competencies to plan and direct necessary activities in an effective, efficient manner, then the system must decide how to provide for development of the necessary competencies, for employment of persons with those competencies, or for adjustment of program activities to match the competencies of the presently employed staff. Staff competency is another program variable over which many local systems presently have limited direct influence.

Program element number three is identified by the terms "supplies, materials and equipment." The rationale is very simply that the development of specific learning activities to facilitate meeting specific student needs not only requires certain competencies on the part of professional staff members, but also suggests the employment of specifically identifiable supplies, materials, and equipment. The range of possibilities in this area of program development can vary from paper and

pencil to computer hardware. Since recent research[58] has supported the position that varying learning styles require varying reinforcements, then detailed planning in this area can also be considered critical from the standpoint of an individual student. This is one program variable which should always be directly controlled by designated decision-makers. Supplies, materials, and equipment cover only those items which can be directly related to learning activities in which students are the primary participants.

Program element number four is identified by the term "facilities." The primary application here is "physical facilities." The physical environment in which programs are conducted has a great deal of influence on the nature and flexibility of those programs. This is one variable over which decision-makers quite often have little or no control. That is why a lack of recognition of the influence which this element can have on a program often dooms the program to failure before it commences to operate. Facility construction or renovation without program facilitation in mind often causes educational decision-makers much consternation.[59] This element should be given serious, direct consideration when developing a program.

Program element number five makes provision for considering the inclusion of "special and/or contracted services" in deliberations about program elements. These are staff competencies related to providing a total educational team in a local school system; but, provision for these services is usually made on a central system level or at least for several schools instead of being on an individual school basis. Exception

may be found in the area of guidance and counseling where the target may be to provide at least one counselor for each school; or in the area of library science, where the target may be to provide a librarian for each school; or the areas of music, art, and physical education at the elementary level may often fall into the special services category. Areas such as this can be used to illustrate the variances among school system staffs and indicate why local school systems must develop a capacity for self-assessment before program development activity can become meaningful. Because of present funding schemes, decision-makers in local school systems often have very little direct control over this variable.

Contracted services usually provide highly specialized services either not required routinely or so expensive that the cost prohibits provision on a routine basis. The availability of fiscal resources is often the limiting factor relative to obtaining these services.

Program elements number six and number seven are identified respectively as "parental involvement" and "community involvement." Again, system characteristics will dictate varying approaches to dealing with these elements. However, as EDIIM implies, they should be dealt with openly from the beginning, not merely as a formality nor superficially through parent organizations, booster clubs or civic clubs. Parents of students and other members of the community-at-large are the investors in educational systems and are more and more demanding a voice in the impact which those systems have on their children and future employees. This is one variable over which decision-makers have to develop influence through openness and maintenance of system integrity. Otherwise they

must possess some kind of power over the community in which the system operates to maintain community relations. These two variables are not often subject to absolute influence from educational system decision-makers.

Program elements number eight and number nine are inextricably linked. "Time" and "interfacing of program elements" are the respective descriptors. Time is an element which must be recognized, sometimes endured, and sometimes seems to be in extremely short supply. Depending upon the level within a system the length of time required to interface certain program elements could range from a single day or week to an entire twelve or thirteen year period of formal schooling. Interfacing is so closely linked to time because it attempts to make a unit of delivery out of elements one through seven and ten. While recognizing and controlling the effect of number eight, time, interfacing is accomplished in an attempt to provide answers to the classic inquiries of "what?, why?, when?, where?, and by whom?, for whom?". Time is subject to little control by decision-makers, but interfacing provides an opportunity for the decision-maker to ply his trade and "earn his keep."

Program element number ten may appear to be so natural an element of any educational model concerned with decision-making that it should be given only cursory attention. However, "program administration" that is not coordinated from the learning situation level of the teacher to the aggregate administrative level of the central office, and even state department of education agencies, may adversely affect any attempts to deliver a program on a sound and effective basis. The control

of this variable will rely on the willingness of various decision-makers to plan and work together and respect each other's proven judgment in the areas for which each is responsible.

Educational System Accountability

As posited earlier, accountability can only be gained when it is agreed upon before operating a system under what conditions the system is to be operated and what the expected results of operating that system are to be. It must also be agreed upon as to which results are to be considered most important should limited resources restrict delivery capacity. And it should be agreed upon as to what evidence will be acceptable as proof of attaining the results sought. These considerations spawned the following specification of levels of the accountability factor.

Statements are required which "specify objectives for clients to attain, student conditions to be altered, educational situations to be developed for decision-making alternatives, and those activities to be used as facilitators in accomplishing these outcomes." Those statements establish agreed upon targets upon which to base operation of an educational system from the beginning. The forms which these statements can take range from "goal statements" which are very broad in scope to individual student behavioral objectives or other targets which are extremely narrow in scope. A partial listing of possible descriptors is provided:

Goal Statements
Major Objectives
Enabling Objectives
Performance Objectives

Behavioral Objectives
Questions to be Answered
Decision Situations to be Acted Upon
Events to Occur
Expected Outcomes
Condition to be Changed
Management Objectives
Priority Statements
Value Statements
Supplies, Materials, Equipment Specifications
Faculty Competency Specifications
Functional Level of Student Competency
Staff Competencies to be Developed and Employment Qualifications
Special Services to be Provided
Descriptions of Activities

These descriptors emanate from the inventory of program elements discussed earlier. The statements formulated at this point in applying EDIIM must be as specific as possible or the effort will be wasted because no evaluation will produce enough substance to verify statements that the system, as it was operated, was or was not effective.

"Resource allocation" depends on primarily four areas of analysis: the establishment of system requirements; the final specification and review of program priorities, either within a program or among programs; a determination as regards the exact availability of resources, which may boil down to availability of fiscal resources; and an open reconciliation by decision-makers of any variances which may exist among the three areas just identified. The primary objective of the EDIIM approach is realized at this phase of model implementation. Actual student needs should have generated the information which eventually resulted in an allocation of resources to provide for delivery of a particular program to a specifically identifiable population of students.

"Evaluation" is considered to have two primary elements: "process evaluation" and "status evaluation." Process evaluation is intended to provide a feedback mechanism for decision-makers during program implementation and operation. The term status evaluation was chosen because more than one point is reached in the life of a program when "terminal points" or "products" are realized; however, both of those terms imply that program life, or some phase of it, has ended. Therefore, the evaluation will provide statements about the status of progress toward some program target. When termination is appropriate or some anticipated product comes into being, the information resulting from the evaluative efforts will provide support for statements by decision-makers. Those statements may indicate that target points in development have been reached, that results were as expected, and that the program should be continued as it presently exists. Less positive statements are also possible. Status-oriented statements about outcome or condition should reflect point-in-time or point-in-development considerations. Many status-oriented statements will be terminal in nature, but that is not necessarily the case. Some status statements specify determinations about decision alternatives.

Summary

Finally, it must be pointed out that each factor, level, and element can be developed to identify a system of its own. That is why such a concerted effort has been made to provide a single referent, a single unit of analysis. Without a thread of continuity, the somewhat chaotic condition of educational system accountability which existed at the time when this treatise was developed would only have another

mechanism to perpetuate itself. If a local school system adopts EDIIM as a conceptual framework within which to determine a need for, develop, deliver, and evaluate the effectiveness of its educational programs, a continuous needs assessment which focuses on learner condition is considered an absolute necessity. Program alternatives must be developed with that identified learner condition at the forefront. And formulation of the statements against which system accountability will be determined must also be accomplished with awareness and understanding of that learner condition.

CHAPTER III

APPLICATION OF THE MODEL

I. INTRODUCTION

This chapter is intended to provide some guidelines for utilizing Educational Decision Information Interaction Matrix (EDIIM) concepts in local school settings. The multiple-matrix format of EDIIM will be used to demonstrate the proposed relationships among general bodies of information pertaining to a local school system. It has been posited that EDIIM can serve as a framework within which information that is required for decision-making can be collected, organized, analyzed, interpreted and reported.[60] Other models are available to facilitate directing the flow of activity and information and can be important to efforts to reach decision points described by EDIIM. However, those models are not of concern in this discussion. The explanations which are developed on the following pages are intended to facilitate formulation of meaningful contexts for the various decision alternatives which might confront a school system's decision-makers.[61]

EDIIM will be presented as an information oriented interactive-analytical strategy which should not only facilitate a change in the manner in which a local school system approaches solving problems, but should also serve as a strategy designed to allow and intended to encourage a local school system to "start where it is" relative to any one or all of the three major areas of analysis represented by the

factors of EDIIM. Those factors were developed in Chapter II. As will become evident, the model does require activity in all three major areas. The explanations of EDIIM are expected to facilitate organizing information into a form suitable for use in a decision mode relative to an identified target student group.

II. A GUIDE TO A STEPWISE APPLICATION OF THE EDIIM MODEL

The explanations developed in this section are proposed collectively as a guide from which applications of the model can be formulated at a selected educational program delivery system level. Each factor will be presented and operationally defined. Next, the various levels of each factor will be discussed with an emphasis on proposed considerations, informational requirements and recommendations for application at that level.

The Levels of Responsibility

Prior to undertaking the discussion focusing on providing proposed guidelines for application of EDIIM concepts, it is considered appropriate to present the context in which those guidelines have evolved.

> The responsibility for the support and control of public education in the United States has been recognized as belonging to the respective states . . . . The Tennessee Constitution of 1834 recognized and first enunciated the need for public education in Tennessee. This constitutional base served as the beginning of Tennessee's public educational system. In keeping with the educational concerns of the people, the General Assembly has established a structure for the state's public educational program by directing the appointment of a chief state school officer, by establishing a State Board of Education empowered to develop policies for the operation and approval of public schools, and by creating local education agencies to administer and operate the schools.

> The State Board of Education is authorized by law to prescribe rules and regulations for the approval, classification, and governance of all public schools. The rules, regulations and minimum standards adopted by the Board . . . are intended to implement the law and to furnish a broad framework of policies within which local school systems operate in providing educational opportunities for the children of Tennessee.[62]

The Rules, Regulations and Minimum Standards for the State of Tennessee also provide guidance for the development of educational programs through the establishment of "Goals of Education."

Goals of Education

In setting out the goals of education for the state's students, the State Board of Education intends to give general direction only and to leave the local education agency the responsibility for defining the goals in specific terms for students in any particular setting.

> . . . Basic to achieving these goals are two assumptions as follows:
>
> 1. Each goal must relate to the individual student and his/her natural and acquired abilities, and
> 2. the public school system is part of the community and, as such, both the school and community contribute to the education of students.[63]

At this point the words "leave to the local education agency the responsibility for defining the goals in specific terms for students in any particular setting" begin to communicate a challenge to a local education agency. A hierarchy begins to establish itself regarding "the responsibility for defining the goals in specific terms for students in any particular setting." One possible concept of that hierarchy is represented by Figure 3.1.

The concept illustrated in Figure 3.1 represents a position that responsibility for describing major areas of focus for educational

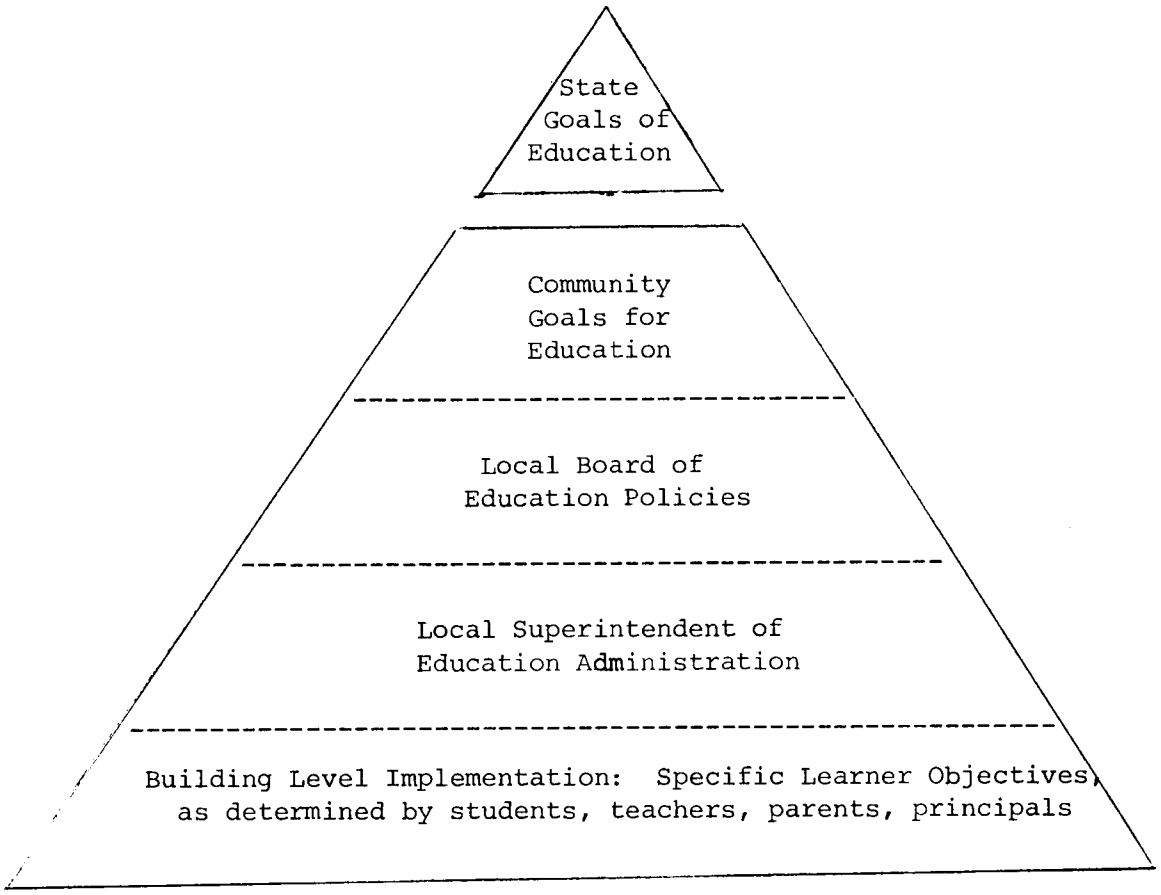
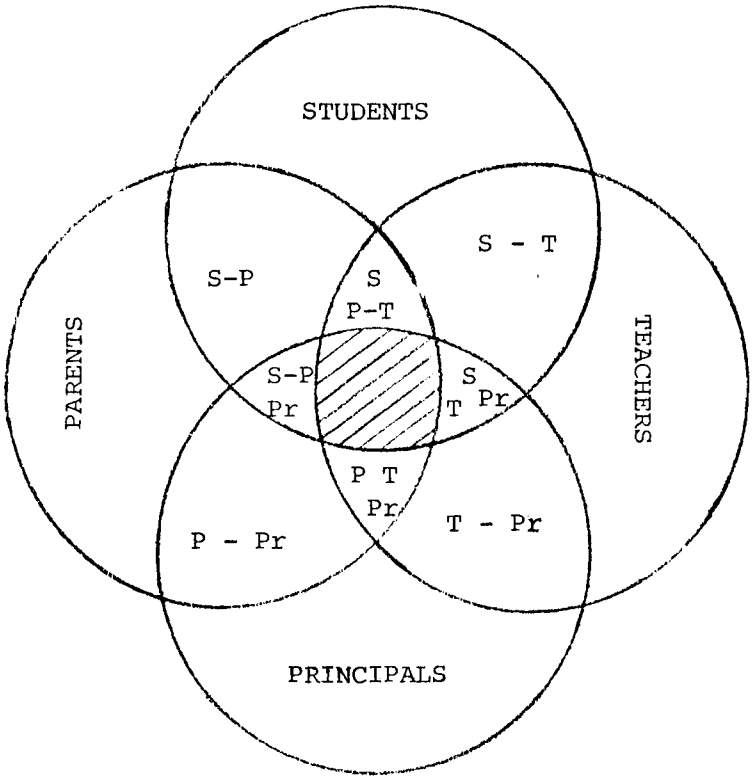


Figure 3.1. A Possible Hierarchy of Responsibility for Defining Educational Goals in Operational Terms

endeavor lies with the state. The State Goals of Education are formulated under the auspices of the State Board of Education whose members collectively and individually ostensibly represent the "community" known as the State of Tennessee and the common good of the citizens of the state regarding the direction which education should take. As responsibility transfers from the State Board of Education to the local educational setting, the community of the local educational setting describes through its day-to-day operation many of those school acquired skills which contribute to a perpetuation of the economic and value systems of a particular community. This is accomplished through jobs which are available in the community, through dominant political action groups, through the activities of civic and religious groups, and generally through other social activities including the placing of priorities upon the distribution of tax monies for support of services delivered under the auspices of the community's governmental agencies. These are some of the ways in which a community describes its preferences for educational programs provided in its public schools, and could be considered as representing "major objectives" in the local educational setting. Also, to some degree the policy statements of a local board of education will reflect the preferences of a local community for the educational programs which are conducted. As the administrative arm of the school board, the superintendent picks up the responsibility baton in an effort to establish and maintain an environment which facilitates developing those refinements that are necessary "for defining the goals in specific terms for students in any particular setting."

Having briefly discussed various responsibility levels impacting on any final determination of specific learner objectives, it remains to discuss building-level responsibility for implementation of programs designed to respond to achievement of specific objectives. This is the responsibility level where the most specific learner objectives are established. Figure 3.2 illustrates a possible conceptual representation of the role interactions necessary to fulfill responsibilities at a building level. It is neither exhaustive in its components nor is it considered too narrow in scope to adequately represent the situation which exists in many local school settings. Most of those situations will differ from each other regarding the degree to which each role influences program development and delivery activities. Such a posture is consistent with the basic tenets set forth previously for EDIIM.

Regarding Figure 3.2, four primary roles are acknowledged as existing in the building level educational setting. These roles are manifested in the forms of students, parents, teachers and principals. Each of these roles is interactive with each of the other roles and quite often three or four roles will become simultaneously interactive. The existence of this characteristic is also compatible with the tenets of EDIIM. As the various role players interact between and among themselves, program becomes operational reality. Figure 3.2, when analyzed relative to Figure 3.1 (p. 51), posits that the four role players can operate on an individual basis or with from one to three other players[64] to gain the specificity desired in describing those learner objectives which are target outcomes for operating a particular educational system.



S = Students

P = Parents

T = Teachers

Pr = Principals

Figure 3.2. Building Level Role Interaction for Program Development and Implementation.

The discussion which follows will propose guidelines for applying EDIIM in a local setting to facilitate coordination of needs assessment, program definition, program alternative selection, establishment of major and operational objectives, resource allocation and subsequent determination of effectiveness levels for accountability purposes. To as great a degree as possible, the discussion will adhere to the schedule which is outlined below:

A. Present EDIIM factors for discussion. Operationally define those factors.

B. Present the various levels of the factors under consideration.
   1. Discuss relative considerations for each level of the factors.
   2. Propose appropriate information requirements to make a level relevant to the situation under discussion.
   3. Make specific recommendations for applying EDIIM. Application would be in a local school setting.

Educational Needs Assessment: Factor Number One

Figure 3.3 illustrates a suggested event sequencing for this first factor. Educational needs assessment involves gathering information first in the context of "what learner conditions would the community prefer to exist in its school or school system" and secondly, in the context of "what is actually happening in the school or school system." When the information has been gathered and organized for comparison, then analysis can be accomplished to determine what differences exist between the conditions indicated by the two bodies of information. When these

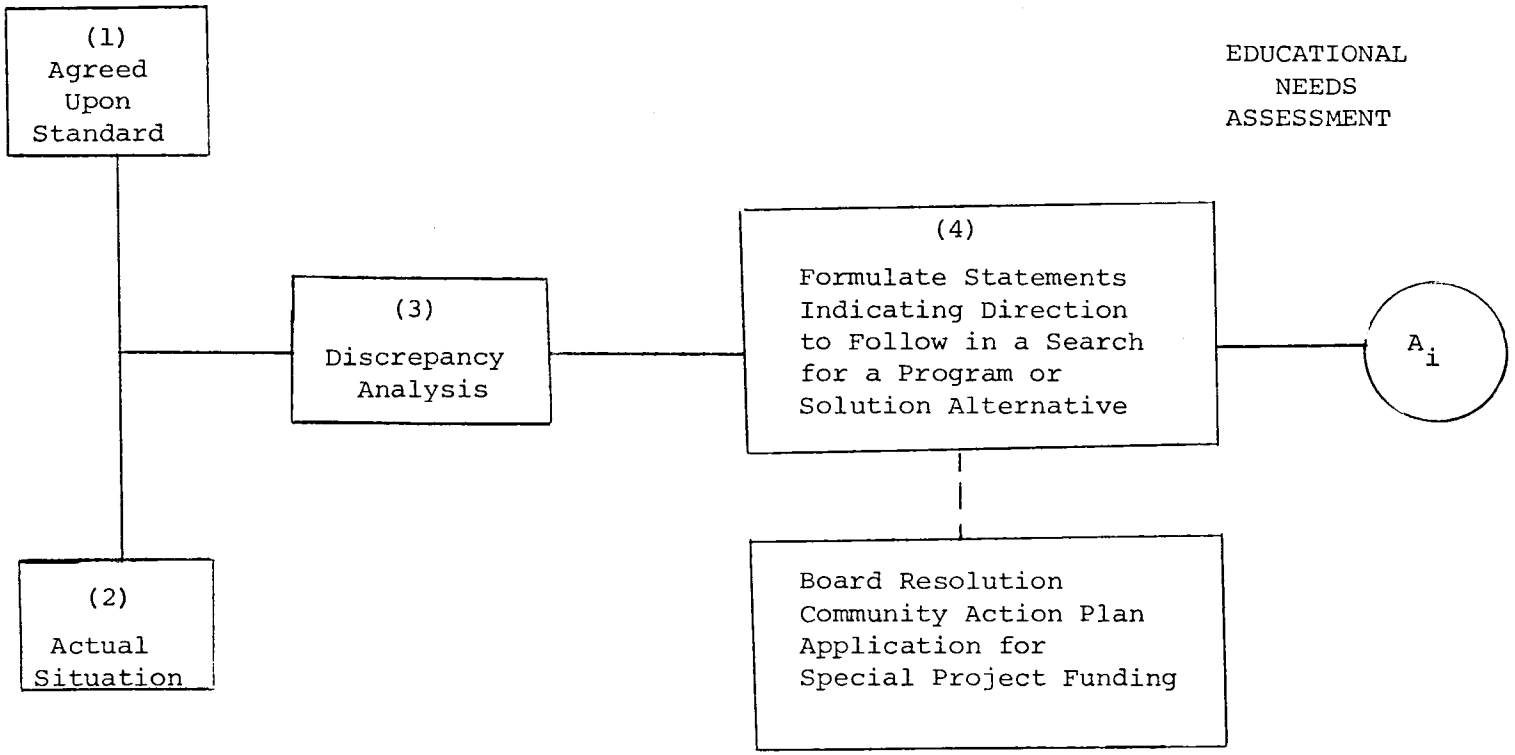


Figure 3.3. First Factor of EDIIM

three steps have been completed, decision-making and program development continue.

Step One. Agree upon itemized standards relative to target learner conditions for specifically identified learner groups. Regarding this first step there are four primary considerations: agreement, itemized standards, target conditions, and specifically identified learner groups. This "step" can actually involve many steps. For example, gaining agreement by itself might often require a multi-step process. The concept of agreement indicates that more than one influence center, party of interest, or special interest group associated with a school might be involved in any decision situation.

A review of Figure 3.4, representing factor number two which will be discussed later, will reveal the identity of five common parties of interest for local school systems: students or clients; building-level professional staff, both teaching and administrative; parents; community-at-large, business, political, patrons, civic, special influence and interest groups, professional members; and central system administrators and specialists. Total agreement among the members of the five constituencies identified: (a) may not be a necessity, or (b) may not be attainable. As with any decision-making process, the greater the number of persons involved in such an activity, the more complicated the process can become and the more necessary a structure becomes for determining the role which each constituency will play in the decision-making activity. Agreement could be gained in varying degrees through activities designed to facilitate aggregation of opinions or professional judgments.

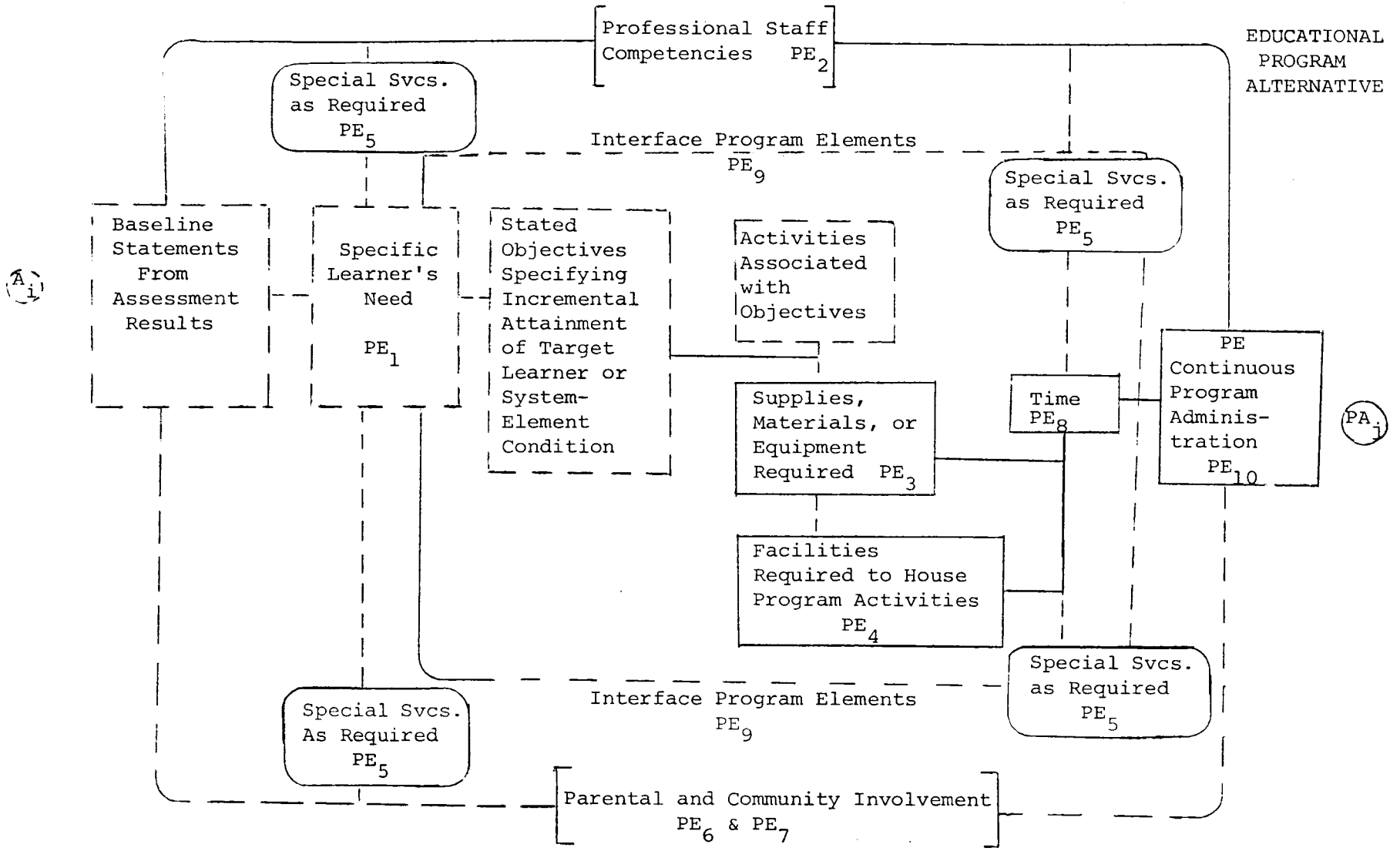


Figure 3.4. Second Factor of EDIIM

The techniques of town meetings, community forum, advisory councils, survey research[65] and DELPHI[66] are examples of such aggregating techniques. The techniques and instruments which are eventually selected " . . . should be designed to elicit outcome information."[67] Those outcome statements will most likely reflect the orientation of the particular constituency or constituent from which they were obtained. That is, a member of the business community might reply in one manner when representing a business influence center; however, he might reply or react in a different manner if his role and orientation changes to that of a parent concerned about the educational program being provided for his child.[68]

It should begin to become evident that the role which each constituency plays in determining what "agreed upon" standards will be recognized as valid can change not only across influence groups but can also change within a single person. An individual could be in the positions of both a member of a local business community and a parent, and thereby play a dual role as a taxpayer supporting education.

Agreement upon any standard learner condition can be purely political at one polar position or left entirely to each individual classroom teacher at the other polar position. It is a proposition of this treatise that in order for "agreement" to be meaningful, it should be gained initially at the state level and ultimately at the individual school building level for implementation at the individual student level. Goals for education are established by the State Board of Education. Local educational systems must possess or develop the capability to further define those goals in specific terms for students in any particular

setting. Two major metropolitan areas in Tennessee are presently developing and refining building-level advisory council strategies for involving individual schools in establishing priorities for the delivery of educational programs. One rural system is working toward a total-community-involvement model for continuous assessment at each school in the school system. The state department of education has recently authorized a comprehensive study of curriculum assessment practices. Before agreement can be attained about anything, there must be a basis for discussion. An information base which is professionally constructed and maintained can serve to focus discussion. Each participant can bring his own opinions, experiences and biases to the discussions. The information base should be developed on a technically sound basis and should be explainable to all parties of interest. Soundness in the context of agreeing might be attained most effectively through meetings which involve parents and teachers. The following scenario might develop. Parents would provide direct statements to teachers about their expectations for their children regarding learning objectives. Teachers could in turn inform parents about the general efforts being made to meet parental expectations. In this context, information is primarily exchanged orally to begin to develop a basis for understanding between two major parties of interest, parents and teachers. If the situation involves secondary students, then the students should begin to assume a major role as a party of interest in the process of agreement until complete transfer of responsibility occurs for assuming the role of a major party of interest in arriving at agreement about specific standards for educational endeavor. The product of this phase should include statements

agreed upon by the parties of interest that articulate standards of performance and learner condition. Exchanges of information which is brought to the setting by parents, teachers and students should eventually complement each other to a point where professional expertise translates parental and student expectations into refined educational goals and objectives which can be appraised as programs are developed and delivered. When this point is reached an acceptable degree of agreement about itemized standards relative to target conditions for specific learner groups could possibly be considered attained.

Statements such as, "students who are clients of the Moofolkee County School system for three of their first four years of public schooling (kindergarten - grade 3) should be able to read at grade level" might result. A standard would have been initially agreed upon and translated into potentially measurable terms by professionals in an educational setting. The standard was not placed in "measurable" terms because determining the relevance of "at grade level" can vary depending upon the referent which a school system chooses. If a nationally normed test were chosen, instructional strategies might be established differently than if a criterion-referenced approach were selected. However, a statement specifying the agreed upon standard can be completed as follows to provide an example:

> A student who is a client of the Moofolkee County School system for three of his or her first four years of public schooling (kindergarten - grade 3) will be able to read at grade level upon completion of grade three. Attainment of this condition will be determined by a student's performance on the appropriate Stanford Achievement Test.

This statement of an agreed upon standard could be inserted in block one of Figure 3.3 (p. 56) and would eventually be inserted in the appropriate informational cell for expansion and utilization of EDIIM.

Based upon the EDIIM model as presented in Chapter II, a partial scenario has been proposed which provides for establishment of an "Agreed Upon Standard." A primary concern is to bring together the various parties of interest for the purpose of reaching agreement about degree of expectation for educational endeavor. The nature of the process is a marriage of parental, student and community expectation with the training, experience and expertise of the professional members of an educational community.

Step Two. Determine the actual conditions of learners relative to the standards which were agreed upon in the course of accomplishing step number one.

When making determinations about the actual conditions of students relative to standards which have been established, procedures employed should grow directly out of the statements that delineated the considerations of the agreed upon standards. The earlier example of a statement of standard can serve to illustrate this point. That statement is as follows:

> A student who is a client of the Moofolkee County School system for three of his or her first four years of public schooling (kindergarten - grade 3) will be able to read at grade level upon completion of grade three. Attainment of this condition will be determined by a student's performance on the appropriate Stanford Achievement Test.

As a statement of what is preferred to exist, the standard sets the stage for determining what actually exists. "The appropriate Stanford

Achievement Test" translates "will be able to read at grade level" into terms that facilitate making statements about the current status of students relative to the "at grade level" standard. The information required to accomplish this step under the conditions established comes primarily from the administration of the Stanford Achievement Test. The soundness of the information gathering procedures and relevance of the information to what is actually being delivered in educational programs are of primary concern. The implication is that the reading skills which are measured by the Stanford are those skills which the school's community expects the clients of the school to have at a particular assessment point or potential exit point.

Step Three. Determine if any discrepancies exist between the proposed standard conditions of students (Step One) and the established conditions of students (Step Two).

This step provides for analysis of the information gathered in Steps One and Two and requires that the analyst produce specific statements regarding the conditions of students. The classroom professional should assume a major responsibility in this analytical activity when it focuses at the building level. Discrepancy analysis should be a competency which all classroom professionals understand, can apply, and can effectively explain its results to parties of interest such as students, parents and school patrons from a community.

District level administrative personnel may be reluctant to encourage the assessment activities discussed here and the framework in which it is eventually conducted could reflect the nature of a local

power structure. That is, applications of this model could be highly directive or could be extremely open ended. In the first situation, all three steps discussed could be carried out "behind closed doors" and only selected statements resulting from step three would be made public. However, all parties of interest could become involved from the beginning as much as possible, and all parties of interest should reach the point when statements about discrepancies requiring reconciliation can be made. A fairly high degree of agreement may be attained initially using either approach. However, it appears that the more covert approach is becoming less acceptable to communities across the United States.[69] The primary considerations focus on who participates and the manner in which results are communicated for utilization as a baseline measure of the degree to which any student approaches agreed upon standards.

A review of Figure 3.3 (p. 56) provides a graphic summary of the discussion just completed. Establishment of the agreed upon standard, determination of the actual situation, and an analysis of the information collected to determine if there are any discrepancies between the two situations all lead to the formulation of statements about the conditions of clients of a school system. Those statements also contribute to establishing directions to follow when initiating a search for educational program alternatives. The cell attached to cell number four with a dashed line indicates some of the forms in which those statements can manifest themselves: (1) board resolutions; (2) community action plans; and (3) applications for special project funds.

Educational Program Alternative: Factor Number Two

A review of EDIIM as presented in Chapter II in conjunction with Figures 3.3 (p. 56) and 3.4 (p. 58) will facilitate understanding the discussion which follows. "Program Element One," the school system's client, should be the focus of activity regarding an application of EDIIM. If the student needs assessment is valid, it should not vary with the development of program alternatives. Program alternatives should be developed and described in the total context of EDIIM as illustrated by Figure 3.5. If this total context approach is adherred to, then initial provision will be made for the Educational System Accountability concepts illustrated by Figures 2.5 (p. 34) and 3.6.

Whereas Program Element One should remain constant, it is expected that Program Elements Two through Ten will be altered to establish those unique characteristics of each program alternative that is developed for analysis and consideration. The ten levels of Factor Number Two are not considered rigidly established, but have been empirically developed by this author as adequate when entering into those activities suggested for an application of EDIIM concepts. Once the initial educational needs assessment involving primarily student needs has been accomplished and directional statements have been formulated, the information cells associated with Factors Number Two and Number Three[70] should be utilized as guides for organizing the information gathered. As progress is made toward developing an application of EDIIM, the information interaction feature of the model will become meaningful.

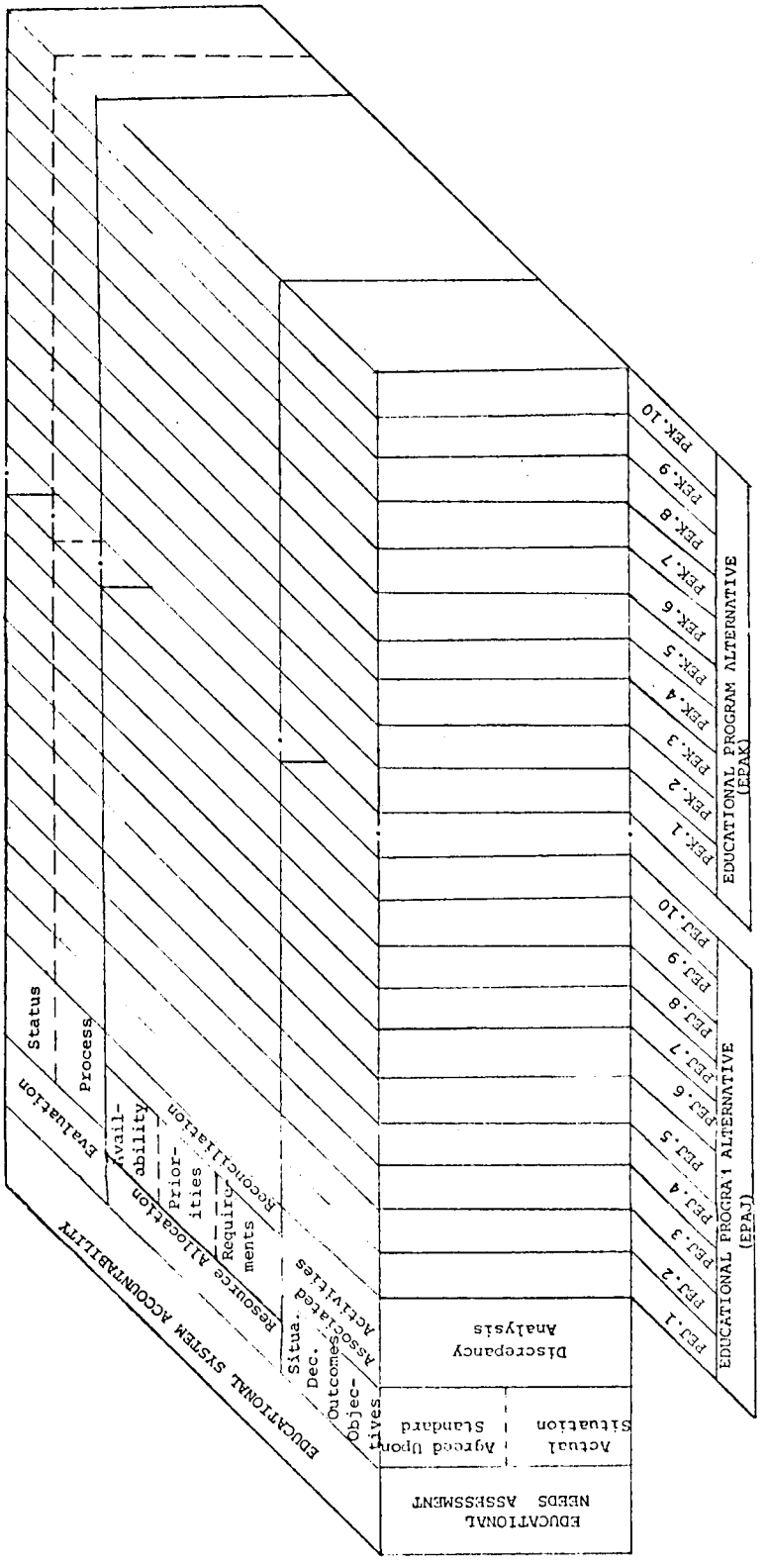


Figure 3.5. An Expansion of EDIM to Illustrate Considerations of More Than One Program Alternative

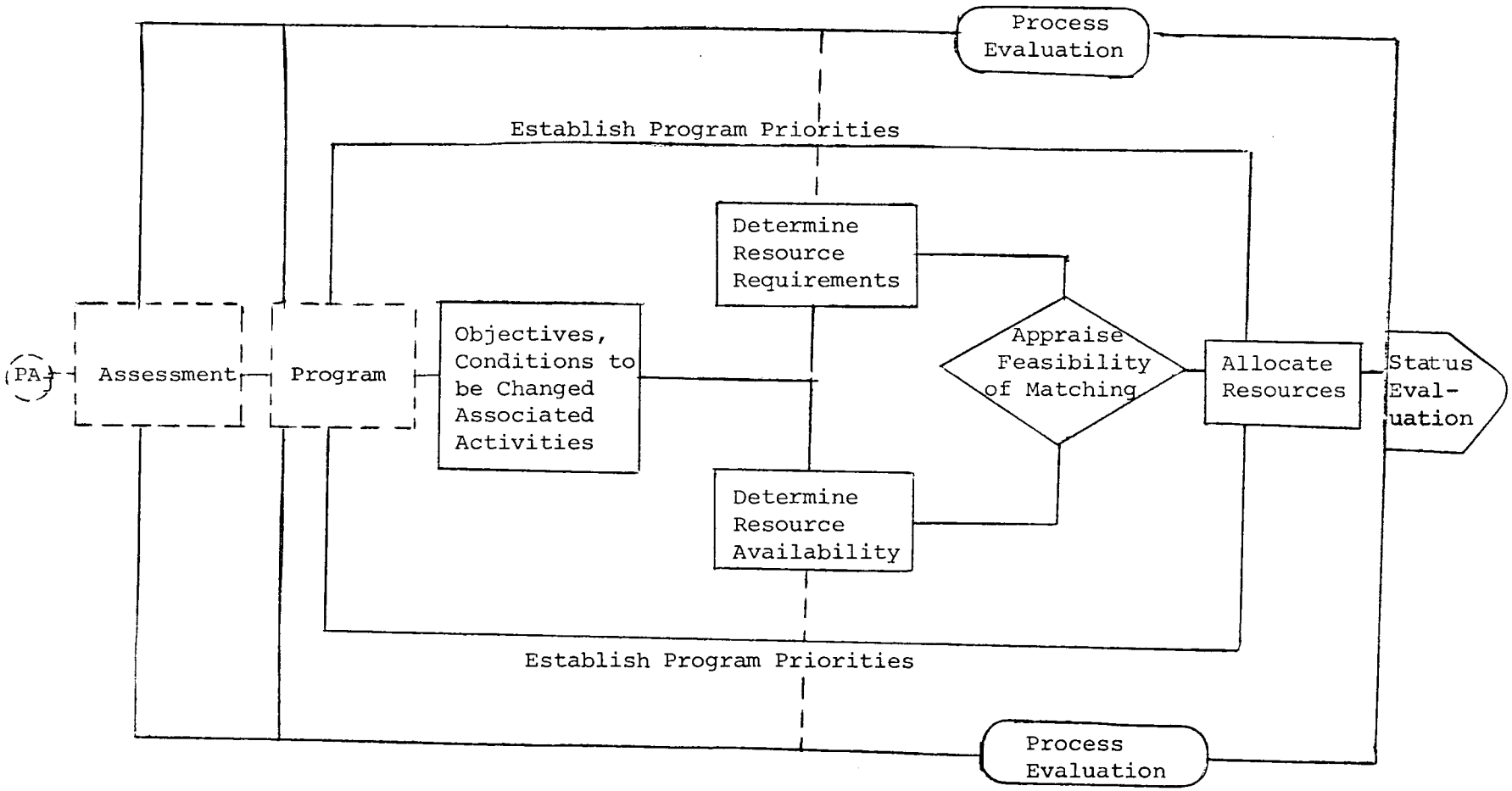


Figure 3.6. Factor Number Three of EDIIM

Educational System Accountability: Factor Number Three

This factor is considered operational when decisions are reached with the following results: (1) precise statements are formulated about addressing individual need areas[71] by establishing relationships among needs, target conditions or objectives, and specific activities in which clients, teachers and others can engage as the methods of instruction; (2) an allocation of resources based upon an analysis of proposed program elements, associated methodological activities, priorities for addressing each need area, and the actual availability of resources which have been identified as necessary for program delivery; and (3) the establishment of agreed upon procedures for both checking incremental progress toward effecting a plan of action which results from educational program alternative analysis and formulation activities and the establishment of status checks on the various entities to be manifested or produced at different points in time during operational activity. These three areas of consideration must be addressed prior to commencing program operation or the degree to which accountability is attained will be irrevocably affected regarding employment of the EDIIM model. And this consideration is one which requires strict adherence to the stated position if it is to be used in the context in which EDIIM was developed.

Factor Number Three is represented by Figure 3.6 (p. 67) as an adjunct to Factors One and Two. That adjunct relationship begins with specification of objectives for student clients or groups of student clients with common areas of need for learning activity. Figure 3.5 (p. 66) can serve as a framework within which to develop the types of decision points which might be reached as programs are described and

priorities are placed upon implementation. Movement among factors of EDIIM is not restricted by any absolute sequencing scheme once a baseline educational system needs assessment has been accomplished and target students or groups of students have been identified. The development of a possible set of decision points for an application will facilitate gaining closure regarding development of an application of the EDIIM concept.

Development of Decision Points

Baseline Needs Assessment Statements.

A. Agreed Upon Standard. "A student who is a client of the Moofolkee County Elementary School for three of his or her first four years of public schooling (kindergarten - grade three) will be able to read at grade level upon completion of grade three."

1. The degree of attainment of this condition will be determined by a student's performance on the appropriate Stanford Achievement Test.

2. Progress toward attainment of the target condition will be measured at least weekly by the teacher or teachers assigned responsibility for a student's reading development.

3. Reports on a student's progress will be provided to that student's parenting person at least every nine weeks. Reports will be provided more frequently when a student's progress is not considered acceptable.

4. When a student's progress is not acceptable, the teacher or teachers responsible for that student's reading development must analyze the present methodology being utilized and identify changes to alter any presently ineffective approach being utilized.

Once these baseline statements of standards have been developed by the appropriate parties of interest associated with a particular building level, the measuring device for the standard relative to the primary referent, the student, must be employed to determine what each student's status is relative to the standard.

B. Actual Situation. When describing the actual situation, responsibilities must be established for administration of the measuring device to the target population of students.

1. A student profile record should be established which provides for recording information to facilitate longitudinal assessment of progress for each particular student. The longitudinal period should extend through grade three for the purposes of this need area.

2. Next, each individual student's status relative to the agreed upon standard should be determined. The status of students whose level of attainment should already be at the standard should be appraised in order that an initial cross-sectional comparison can be made of the "beginning" status of students with the proposed exit point status of students who are already at a potential exit point in development. This comparison may give some present indication of change in the conditions which have been experienced by students across three or four years of exposure to a particular local educational program. Ideally, the third grade level students would have been tested at some earlier points in time and a comparison of individual progress levels could be made for inclusion in the discussion of student status.

C. Discrepancy Analysis. Information collected during initial assessment activities for use in this step of the assessment activity should be analyzed with a final objective in mind of formulating statements that indicate within what areas students may not be meeting standards.

1. Compare each student's scores with the established standard and record the results of that comparison on the student profile record.

2. Make detailed statements that establish each student's condition relative to itemized standards. When this activity is completed, Program Element One will be initially established. Target students will be identified. Need areas can be specified.

At this point, it becomes possible to depart from any necessarily sequential treatment of the various factors and levels of EDIIM.[72] Also, it becomes necessary to raise pertinent questions to guide specification of details about remaining program elements. Many of the questions could be raised in the context of a needs assessment.

Development of Educational Program Alternatives

A. Program Element (PE_{i1}): System Client. Target students are identified in the needs assessment process but a separate statement specifically identifying students to be served would be useful for organizational reasons.

B. Program Element (PE_{i2}): Staff Competencies.

1. What particular competencies must exist among staff members to facilitate delivering the activities specified for promoting progress toward designated outcomes?

2. In what numbers must those competencies be available among staff members to serve the numbers of students identified as needing certain activities?

3. To what degree are the required competencies already present among staff members? First, are they available; second, in what quantity are they available?

4. If competencies are not available in the quantity desired: (a) are new persons to be routinely employed soon; (b) can someone be employed with the particular competencies which are being sought; (c) can a staff development program be provided to generate the competencies among the existing staff?

5. What priority will be placed on the delivery of the identified activities? Therefore, what priority will be placed on obtaining the staff competencies which are associated with that delivery?

6. What costs are attached to various levels of availability associated with staff competencies that are identified?

C. Program Element (PE_{i3}): Supplies, Materials and Equipment.

1. Specifically identify supplies which will be required and associate them with the activities in which they will be used.

2. Provide costs of those supplies.

3. Specifically identify materials which will be required and associate them with the activities in which they will be used.

4. Provide costs of those materials.

5. Specifically identify equipment which will be required and associate it with the activities in which it will be used.

6. Provide cost of that equipment.

D. Program Element (PE_{i4}): Facilities.

1. Specify the types of facilities in which activities can be most appropriately conducted. Establish the degree to which those specific types of facilities are necessary to program delivery.

2. Do the faciities presently exist or would construction of the facilities be necessary?

> NOTE: Exactly specified facilities can often be a critical element relative to program delivery. It is therefore recommended that criticalness be established absolutely at this point so that a determination can be made regarding continued program planning activity. There is no apparent reason to continue to consider development of an alternative which is excluded by the necessity of having facilities which cannot be attained.

3. Are facilities which exist adaptable to meeting program needs?

4. Do facilities which exist meet specifications for housing special equipment that will be a part of the program? (For example, computer equipment often requires temperature and humidity controls and special wiring set ups.)

5. Are existing facilities due for replacement in a relatively short period? Could the interim be used to continue planning and development until new facilities are available?

6. What costs are attached to the various alternatives for providing facilities?

E. Program Element (PE_{i5}): Special and/or Contracted Services.

1. Are any special services required?

2. If special competencies are required, can they be provided periodically through central office personnel or on a contractual basis through an agency outside the school system?

3. What costs would be associated with providing any special services: (a) through employment of a full-time building level staff member; (b) through a central office specialist; or (c) through contracts with an outside agency?

4. Relate any special services to the activities which will be directly or indirectly supported.

F. Program Element (PE_{i6}): Parental Involvement.

1. Should provisions be made for parental involvement? What are those provisions? Over what length of time will that involvement be encouraged?

2. Should parents be assisted in efforts to provide reinforcement for students in the home environment?

G. Program Element (PE_{i7}): Community Involvement.

1. Should provisions be made for community involvement? (The "community" is where clients of an educational system function in their daily lives.) How do the provisions which are made facilitate maintaining awareness of that community?

2. Are community representatives used as resource persons?

3. Is the educational program reflecting the advances made in areas of community life?

H. Program Element (PE_{i8}): Time. Program Element (PE_{i9}): Interfacing Program Elements. Program Element (PE_{i10}): Program Administration.

These last three elements are grouped because they are easily linked. Time is the element which can often make or destroy a learning

activity's effectiveness. Time is a referent for interfacing program elements and guaging program conduct for administrative actions.

1. How much time is required for each activity? (Time)

2. Is sequence important in carrying out activities? (Interfacing)

3. Which resources are required to support the delivery of any specific program activity? (Interfacing)

4. When should any particular activity be started and finished? (Time-Interfacing)

5. Are program delivery tasks and responsibilities assigned and delineated among staff members? Are those staff members informed about specific role expectations? (Administration-Interfacing)

6. Are there any costs associated with these aspects of program delivery? What are the costs and what are the specific items of cost?

Develop Educational System Accountability

A. Objectives, Outcomes, Decision Situations, Program Activities.

Need areas are identified through the actions taken within the framework of "Factor Number One: Educational Needs Assessment." The task still remains to specify learning objectives to guide incremental closing of whatever gaps are defined during needs assessment activity. This process of specifying objectives for learners across various levels of learner development within a need area helps operationally define rather broad statements such as "will read at grade level."

1. Are the statements about objectives, outcomes, or decision situations specific enough to facilitate measurement of the degree to which they are attained?

2. Are activities specifically designed to help attain the target condition which is sought?

3. Are descriptions of "classroom" learning activities developed in enough detail to be useful in making determinations about the competencies which teachers will require to fulfill their planning and facilitating roles as classroom managers?

4. Are descriptions of "classroom" learning activities developed in enough detail to be useful in making determinations about the types of facilities which will be required to house those activities?

5. Are descriptions of "classroom" learning activities developed in enough detail to be useful in making determinations about the quantities of supplies, materials, and equipment which will be required to support designated activities?

6. Are descriptions of "classroom" learning activities developed in enough detail to be useful in making determinations about whether special services will be required to facilitate delivery of those activities?

B. Resource Allocation.

This may be the most difficult level of an EDIIM factor to effectively operationalize. There is no quick and easy formula at the local level for establishing priorities on the commitment of resources. Perhaps the following description of a possible approach could be considered. Because of the difficulty of dealing with this level it is being treated with a specific suggestion. The suggested approach does rely on adequate consideration being given to factors and levels already discussed.

Requirements and the availability of resources to meet those requirements can usually be established if previously described steps are completed. Funds at the district school level must be divided in some manner among building level programs, and if priorities are not established at the district level, then building level parties of interest must collaborate to determine how resources are divided. That is the suggested approach. Provide resources to building level personnel who then decide in collaboration with parents and appropriate community members what priorities to place on programs. This approach has met with success in California and is being tried in a rural local school system in Tennessee on a pilot basis. Larger systems are attempting to implement variations of the approach because they are faced with spread out building level constituencies due to busing requirements. In such a scheme primary accountability is placed at the location of the student, which is where the ultimate measure of effectiveness must be made. However, decision authority is also placed in the hands of those responsible for program effectiveness. Such an approach could make reconciliation a manageable consideration.

C. Evaluation.

There are two primary concerns for evaluation.

1. Were activities accomplished according to the program specifications?

2. How effective were the approaches employed regarding learner outcomes? There is no "recipe" for evaluation. Each evaluation design must be formulated compatible with the particular situation being evaluated. Evaluation designs can be detailed and formulated based upon

specific program activities or more generally based on aggregate student performance. There are many evaluation models from which to select an entire model or to select elements for constructing a design for a particular situation under consideration. A primary concern in evaluation should be to develop information bases from which decision-makers can operate with confidence. An information base should be soundly developed and information should be available to those requiring it on a timely basis in the form and quantity required. Other questions which an evaluation might help to answer are listed below.

3. Was the program effective enough to warrant continuing it?

4. Can any program elements be identified as more critical to program delivery than any others?

Specific questions about student progress might be answerable because of evaluation efforts.

5. Did each student make at least one year of progress in reading achievement as measured by the appropriate Stanford Achievement Test?

The following summary statements about evaluation have served this author well. "The purpose of evaluation is not to prove but to improve."[73]

Evaluation: Formulate an evaluation strategy. Evaluation is required for accountability, to support continuous decision making activities, and to provide a basis for dissemination of program results.

Purpose: (1) The purpose of evaluation is to provide specific, ordered, timely information to decision makers at all program developmental and operational levels. Evaluation should relate the information provided to the requirements of the user of that

information, i.e., students, teachers, principals, parents, supervisor, superintendent, member of the board of education and State Department of Education.

Design: Each evaluation design could focus on five questions: (1) In what setting will the program take place? (b) How well are the components of the program described? (c) How well is the process working to bring together the setting and the program elements? (d) To what degree were the expected outcomes attained? (e) Do the costs which must be incurred prohibit installing the program in similar local school settings?[74]

Interactive Sequence of Events

Having presented each factor, provided operational definition through various qualifying statements, and identified some initial considerations regarding application, the task remains to present a possible interactive sequence of events. A possible factor, level and element interaction scheme is outlined below. The terminology and brief descriptions should be viewed in the context of developmental information already presented in this chapter.

Factor: Educational Needs Assessment (ENA). Accomplish the ENA levels of action utilizing a specific area of student development to focus those actions.

Factor: Educational Program Alternative (EPA). Establish program element one (PE_{i1}) by designating a specific student type or group as the target of EPA development.

Factor: Educational System Accountability (ESA). Develop statements reflecting specific objectives, outcomes, or decision situations relative to ENA statements for the particular student group of concern.

ESA: Develop description of activities for facilitating attainment of each objective, outcome, or decision situation which is identified.

EPA: Program Element Two (PE_{i2}). Make a determination regarding those teacher competencies which are considered required to manage a classroom learning situation like that described by the activities designed to facilitate attaining designated objectives, outcomes, or decision situations.

EPA: Program Element Three (PE_{i3}). Specify supplies, materials and equipment which are appropriate to facilitate delivery of those activities which are considered necessary to attainment of identified objectives, outcomes, or decision situations.

EPA: Program Element Four (PE_{i4}). Specifically describe the facilities which are necessary to provide an appropriate physical environment for activities related to the program.

EPA: Program Element Five (PE_{i5}). Specifically describe specialized or consultative services required to support delivery of program activities.

EPA: Program Element Six (PE_{i6}) and Program Element Seven (PE_{i7}). Determine those areas of program related activity where parental and/or community involvement would be considered either necessary or appropriate.

ESA: Review all proposed resources required for program delivery and establish costs related to providing those resources.

ESA: Review or establish priorities on objectives, outcomes or decision situations which have been identified as appropriate for focusing program related activities. Also, place priorities on programs related activities. These procedures will place priorities on the resources which have been identified as being required.

ESA: Review or determine actual resource availability (primarily, PE_{i2}, PE_{i3}, PE_{i4}, PE_{i5}) to facilitate delivering program related activities.

ESA: Reconcile any variance among requirements, priorities and actual resource availability.

EPA: Program Element Eight (PE_{i8}). Determine the time requirements for effecting program delivery through specified activities. Take into consideration any restrictions brought about by resource availability or forced target time lines for objective, outcome, or decision situation attainment.

EPA: Program Element Nine (PE_{i9}). Propose how program elements can be interfaced to deliver program related activities; devise a program delivery plan.

EPA: Program Element Ten (PE_{i10}). Provide for facilitating actions through administrative plans associated with program delivery: organizational structure, communication plans, implementation plans, evaluation design, dissemination plan, resource allocation plans.

ESA: Provide for evaluation of consistency with and effectiveness of program delivery plans--process evaluation.

ESA: Provide for determining the degree to which objectives, specified outcomes, or decision situations are gained at any designated point in time--status evaluation.

The possible interactive sequence which was presented above for considering each factor, level, and element of "Educational Decision Information Interaction Matrix" suggests an approach to be used in developing more than one educational program alternative for review. Such a review may lead to an alternative which is not considered the most desirable, but which is the most feasible under the circumstances that have been surveyed and analyzed. A review of Figure 3.5 (p. 66) indicates that more than one program alternative can be developed for comparison using EDIIM. EDIIM should be the referent and as the information cells are developed the process becomes one of reviewing the information collected in the context of a particular school setting and making decisions.

Recommendations About Application

Some recommendations are presented below regarding any attempts to develop an application of EDIIM.

Recommendation Number One. Regarding moving toward agreement on itemized standard learner conditions, it is recommended that an adult educational program be developed and conducted to orient the various parties of interest to the existing local public educational enterprise. That program should be based upon professionally developed, current information rather than leaving orientation to any remembrances of a particular

constituent's "school days" and those impressions created by varying discussions that might be presented via today's media by other professionals, politicians, and special interest groups.

Recommendation Number Two. Interaction should be facilitated between and among the various parties of interest enumerated earlier from Figure 3.4 (p. 58). It is recommended that building level representatives of the school system have responsibility for facilitating those interactions. Vehicles for accomplishing this are advisory councils, personal conferences, parent coffees or mixers, round-table discussions, and others. Approaches should vary as the purposes for interacting vary and as the participants in the interacting vary. There is not a single approach to carrying out this recommendation. The proposed constant is that representatives of the building level educational staff should provide initiative and leadership in facilitating interaction.

Recommendation Number Three. Educational professionals should be called upon to work together to develop definitive statements regarding the exact educational nature of proposed itemized standard learner conditions. The degree to which an area focusing on treating some particular learner condition is "itemized" for analysis may depend upon the constituency proposing and developing the itemization. For example, parents may propose that a priority be placed upon "all sixth graders being skilled in addition, subtraction, multiplication and division of whole numbers." Whereas, professionals in education could continue to define the varying incremental skill levels required to attain this more broadly stated skill area.

Recommendation Number Four. Roles must be clearly described and agreed upon. "Who will define the various levels of the itemized

standards" becomes a pertinent question. The proposal here is that communities generally determine the life skills that students require and professionals in education accept responsibility for determining to what degree the clients of the educational system possess those skills or desired conditions of human development. Those professionals can then work to facilitate the delivery of programs designed to guide students' efforts to attain specified conditions at some predetermined, acceptable, incremental growth level.

Recommendation Number Five. For standards for which progress toward attainment ranges over several years, planned assessment of incremental progress is strongly recommended. Planned assessment serves as an element of those activities designed to determine if the program strategy is being effective.

Recommendation Number Six. Assurances should be made that test administration skills are possessed by those persons responsible for any test administration.

Recommendation Number Seven. An extension of number six is that persons responsible for interpreting test information should have interpretive skills. Interpretation in this instance means capable of translating test information into appropriate impact on instructional approaches.

Recommendation Number Eight. Test analysis should be planned and computer processing readily available if large numbers of tests are administered at a single point in time or if testing for progress is accomplished daily some provision must be made to streamline analysis. Timely

availability of information about rate of and degree of progress is a critical concern during the process of designing educational programs to be delivered to students.

Recommendation Number Nine. If information is gathered for use in making determinations about attainment of standards, then provisions should be made to insure its use or effect its rejection based on open review. Knowledge of the present status of the individual learner relative to the agreed upon standard is required information.

Recommendation Number Ten. Broadly based involvement by various representatives of the parties of interest is recommended.

Recommendation Number Eleven. There are some implications for accountability in the extension of broadly based involvement. A pedagogical approach which is sometimes used to baffle students can be used to illustrate. That approach involves the selective release of information. A problem is stated, then, additional information is provided on a selective basis as discussion progresses. Frequently, decision patterns are reversed based on the additional information. The danger in such an approach is based on the choice of the information controller to share only part of what is known. That approach is contrasted with what is proposed here: all information should be shared "as openly as possible" from the beginning. The qualification is placed on the preceding statement because legal, professional, or confidentiality concerns cannot be overlooked. The proposition here is that until the various parties of interest establish communication on an open basis, there may always be some bit of information "lurking" that when revealed at a later point in

time could have a reversal effect on decisions that were made. Openness may be threatening at first. However, once, it is practiced routinely, it may lead to greater understanding and more efficient and effective decision-making about areas of need among students.

Recommendation Number Twelve. It is recommended that the results of any analysis be reported in terms that each audience for the report can easily understand. If more than one presentation is required, to carry out this recommendation, one of two alternatives might be selected: (1) prepare a report for each audience; or (2) prepare a report which communicates to the most unsophisticated audience. Maintaining the interest and participation of the parties of interest becomes critical to long-range activities during an application of EDIIM.

Recommendation Number Thirteen. Develop the Educational Needs Assessment Factor in such a way as to provide for continuous review of the needs which are established from any baseline analysis. An error which is often made when an assessment activity is completed is that "it is completed." Needs assessment cannot be terminal in nature or the resources expended in conducting the baseline activity are absolutely wasted. The common objection that "the results of a needs assessment are never available until they are no longer valuable" can be reconciled positively over time if needs assessment becomes continuous. A baseline activity can require the commitment of a greater quantity of resources for the amount of time involved than the maintenance activities for a continuously operating endeavor. It is proposed that a continuously maintained needs assessment will respond just as sensitively to the

requirements of its users as a well-tuned automobile responds to the demand for acceleration which its driver may generate due to circumstances which might arise during driving. Just as that automobile system has been developed and refined over the years, it is proposed that humans can develop and massage a needs assessment effort until it is sensitive to the day-to-day demands placed upon it by its users. Technology can now make such a posture a realistic expectation just as technology has made the reliability of the automobile a realistic expectation. The essence of this recommendation is that it can be difficult to pick up where you left off if you left off 20 years ago.

Recommendation Number Fourteen. Initial efforts at recording information to be used in the context of EDIIM should employ a narrative technique. As the approach develops, spinoff benefits can result. Some examples would be in the areas of individualizing instruction and the follow-up required in the area of staff development to provide teachers with competencies required to manage individualized instruction. Needs assessment that focuses on individual learner conditions implies that an appropriate next step would be educational programs which are flexible enough to deal with each student's individual needs. As approaches to accomplishing such tasks are discussed, teachers, parents, and principals may realize that different skills, facilities, supplies, materials, and equipment than those presently available will be necessary. However, if brevity in establishing records is the rule, then discussion may never accomplish more than superficial treatment of any points under consideration. If the agreed upon standard stated earlier merely proposed

that "third graders would be able to read," then each parent may feel that the statement guaranteed that his child would be a third grader with an ability to read as well as any other third grader. Individual attention would be an expectation. The presence of teacher competencies and required facilities, supplies, materials, and equipment would not necessarily be questioned because "we all know schools teach reading." Whereas, teachers may react that if "on the average" my students can read, the standard will have been satisfied; "everyone is aware that if they mean differently, I'm not a reading specialist and our school doesn't have all the necessary elements for delivering individualized reading programs." Principals may feel comfortable with a decision that achievement tests can be appropriately administered to third graders and "on the average" students will be able to read at their level, so he or she can feel comfortable about the strength of the school's staff and the patterns of resource utilization. But suddenly a parent learns at the middle of the fifth grade that a student which measured average or only a little below at third grade is consistently below average in several areas because of poor reading ability. That same parent remembers a meeting when his or her child entered kindergarten. The meeting focused on something about being able to read. Well, "he had assumed that meant his child." The teachers assumed he understood that the methods which were employed would produce "normal" results: some would achieve high, some average, some low. In a situation such as this brief scenario describes, there was no communication based upon mutual understanding. No one talked very extensively, no one spelled out in detail, and no accountability was attained. Mistrust was developed. A basis for denying resources was established. Accurate and detailed records should be

developed to facilitate comparisons across all the elements of program. Questions of "what ought" and "what is" can then be routinely addressed for each element of program.

Recommendation Number Fifteen. An approach identified in Chapter I as "marginal accountability" should be adopted regarding student development. This approach is recommended over the present system of average accountability for student development. This recommendation does not imply any expectations that all students will develop at the same rate or to the same degree in any particular area or all areas of educational endeavor. This recommendation provides for accountability regarding student development on a realistic basis. It is, however, perceived to be the most difficult recommendation to implement.

III. SUMMARY

The operational definitions, implementation considerations, informational requirements and recommendations which have been presented in this chapter may only suffice to facilitate initiating development of an application of EDIIM. It must be understood that developing an application of EDIIM should be done in a context similar to the one which it proposes for student development. That context, when translated to a school or community as an entity, becomes more complex to manage. But variances in the developmental capacities of schools and communities must be as readily recognized as the variances in the developmental capacities of students. Incremental development must be acceptable to a user of EDIIM concepts. A community or school cannot be changed

immediately. The concept of marginal accountability can be employed to monitor progress. Being successful with clients of an educational system "on the average" should **no** longer be acceptable.

This is the message being sent by the various court decisions cited and the finance model reviewed in Chapter I. However, implementation guides are not often provided by court decisions or finance models. They only serve as devices to set parameters for change. The details must be worked out by and for those "in the trenches." EDIIM has been presented as an alternative framework that could be utilized as a referent by both macro and micro planners and workers. It has been presented here as primarily a referent for micro application. That initial position is taken due to a perception that before general equity can become meaningful, a plan for attaining specific equity must exist. The finance model reviewed in Chapter I offers a plan for attaining general fiscal equity but not for attaining specific educational equity. It was a proposition of this treatise that if a plan for attaining specific educational equity were available to suggest how to provide the information to support a plan for attaining general fiscal equity, then such formerly nebulous terminology as equal educational opportunity, equal access to a quality educational experience, and quality education may begin to gain some basis for operational meaning. Student information may continue to be represented for the state fiscal resource allocation plan as so many students per school per grade level. However, within each local school system and at each building level the term grade level can begin to mean a specific

program for education based on student needs. Eventually, it may become possible to state accurately that educational programs have evolved. Then, the operational concept of grade level could be changed to one of program level by areas of concentration, such as reading, math, science and social studies. Without a framework which can remain constant during any transitional period however, it is proposed that the transition will be disjointed and chaotic if it occurs at all. EDIIM represents an initial developmental effort targeted at formulating such a framework.

CHAPTER IV

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

I. SUMMARY

The purpose of this study was to present a proposed educational planning model designed to bring bodies of educational decision information together so they might play a meaningful role in specific educational decision-making activities. The study was limited to development of a model. That model was proposed for use as a guide by local school systems but was not tested over a sample of local school systems to establish its practical validity. The validity of Educational Decision Information Interaction Matrix (EDIIM) was proposed relative to the theoretical bases of system analysis from which it was evolved.

The developmental effort was based on certain assumptions. The primary considerations for those assumptions were as follows: that students should be a primary referent for any educational system; that continuous educational needs assessment is a necessary component for maintenance of an information base required to make sound decisions about allocating resources to support educational programs; that the multiple-matrix format of EDIIM is appropriate for bringing the components of a decision situation into perspective and illustrating the complex relationships which exist among elements of information in an educational decision situation; and that the systems theory upon which EDIIM is based insures its generalizability to various educational settings.

The study provided for the development of the conceptual framework underlying the model. That framework suggests three major factors of EDIIM: Educational Needs Assessment, Educational Program Alternatives, and Educational System Accountability. Those major factors are broken down into levels which suggest developmental activities relative to any particular educational setting. There is no proposition that EDIIM is a recipe for educational planning activity. It is suggested as a framework within which an educational system evolves its own recipe for change. It represents a concept of planned change based upon openness for the purpose of facilitating free exchanges of information among decision-makers in any educational setting.

II. CONCLUSIONS

Conclusions are drawn from a review of EDIIM relative to the list of evaluation questions set forth in Chapter II. Each question is restated for reference and responses relating to EIDIM are provided as conclusions of the study.

1. What is the single system to be modeled?

The "single system" proposed is any local educational setting. The recommended application level is the building level. There are implications for a broader range of application. The information bases that are required to do sound educational planning should be developed from the local school building level. Otherwise, it is suggested that the practice of forcing aggregate planning decisions on local school systems through fiscal resource allocation formulas will be perpetuated.

2. Should a unique model be built for each subsystem?

Unique information systems should be developed for each subsystem if "subsystem" is defined by a local school building level organizational structure. The factors and levels of EDIIM have initially surfaced as important considerations in educational planning activities. Each application of EDIIM will be unique to the extent that the information which fills its matrix cells is unique from educational setting to educational setting. Decision-making activity is itself perceived as situational. That situational nature will give each application of EDIIM an appearance of uniqueness. However, the EDIIM model which provides for synthesis of information across various situations is intended to be a constant and should offer a basis for comparison of the results of each application. A unique model is not necessary for each subsystem. Each application may be unique.

3. Who are the decision-makers?

A restatement from the "Definition of Terms" section of Chapter I provides an appropriate response to this question: "A Decision-Maker is the person or group exercising judgment in a decision situation." In the context in which EDIIM has been presented, a decision-maker can be a student, parent, teacher, principal, instructional supervisor, superintendent, school board member, or, depending on the situation, several other decision-makers could be considered eligible for this classification.

What assumptions are made about the decision-maker who would use the model? Unless qualified, any response to this question could be misleading regarding EDIIM. All decision-makers would not necessarily be aware that they were "using" EDIIM. It is proposed that their participation (in decision-making) is promoted by the strategy of EDIIM.

Therefore, one assumption may appropriately be that macro-level decision-makers who exercise gatekeeping prerogatives are proponents of the concepts of EDIIM or are at least willing to facilitate employment of its concepts on a pilot basis. Another assumption about users is that they must be amenable to some type of centralized orchestration of the decision-making process. There are various roles which are appropriate for decision-makers to assume and some effort must be made to facilitate activities which provide for understanding among participating decision-makers of each role which others may play. That various decision-makers are willing to consider that there may be more than one way to deliver educational programs could be considered a critical assumption. A primary assumption regarding the context in which EDIIM has been presented is that parties to the decision-making process are willing to be open with each other. A final assumption is that participants will place priorities on educational programs.

4. Who is responsible for the generation of alternatives?

Each participant in the decision-making process shares the responsibility for generating alternatives.

How are they developed and by what criteria are they compared? Alternatives are developed based upon any considerations delineated through the elements of factor two, Educational Program Alternative. They are developed through the collective efforts of identified parties of interest. The alternatives are compared primarily based upon criteria which evolve from the needs assessment effort and resource allocation analysis. These sets of criteria emerge from collective "best guesses" and professional judgment regarding the probable effectiveness of any alternative to successfully address the determined needs of the clients

of a particular educational system and the reality of resource availability to support any one decision-alternative rather than another. As noted earlier, EDIIM represents a process which serves to establish criteria for comparison. EDIIM is proposed as a primary referent against which to appraise the adequacy of a program development process. The degree of consideration given the factors and levels of EDIIM during any application of its concepts is proposed as a measure of soundness of that application, and, subsequently, the validity of EDIIM as an educational planning model.

5. What are the goals, overall objectives or targets involved?

The term goals is more appropriately applied because the expected outcomes are fairly global; objectives are anticipated as a result of any application of EDIIM. The goals are as follows: (a) to facilitate establishment of continuous review procedures for educational planning activity at the local school building level across varying educational settings; (b) to promote analysis and sharing of information bases by the educational decision-makers who are associated with an information base; (c) to provide for evaluation of program alternatives in a nonthreatening accountability context which seeks to "improve, not necessarily prove;" and (d) to insure to as great a degree as possible that all information which is developed by a school system is based upon sound information management procedures.

What is their purpose? Comparison of results among educational settings could be facilitated if decision-making procedures could be more orderly and described more accurately. This treatise posits that as decision processes are described more fully and accurately relative to a

particular educational setting, reasons for successes and failures may be more widely shared. Such results are expected because there will be a greater number of persons allowed to participate in decision-making activities and the "word-of-mouth advertising" base will expand due to a greater base of persons with knowledge about what is actually happening. The primary purposes emerge as promoting interaction among various information bases through the participation of decision-makers who are associated with those information bases. One qualifying statement is considered appropriate. While proposing to leave specific definition to the parties of interest in any local setting, specific definition of educational objectives and resource allocation decisions would be accomplished in accordance with any applicable state level rules, regulations, and minimum standards. However, scheduled consideration of alternatives is proposed to provide a basis for more accurate appraisal of the validity of state-level guidelines over a period of years.

6. Are priorities or weights involved? What is their purpose?

Setting priorities for the allocation of program resources will emerge as a decision activity during an application of EDIIM. Weighting would be a viable approach to establishing priorities, however, no conclusions were reached as a result of this study about the employment of various schemes for placing priorities on one program rather than another. Priorities should emerge from the collective judgment of the various parties of interest in a particular educational setting. Any weighting schemes which are devised should be a product of developing that collective judgment capacity. This was not a major area of emphasis for this study.

7. Are performance and effectiveness involved? How are these concepts defined and how are they measured?

These concepts are involved but must be defined relative to each particular application and are measured by the degree to which expectations that are set forth are realized. Measurement is planned relative to whatever is being measured. Primary referents for determining how effective any educational enterprise has been are the developmental levels attained by the collective and individual clients of the enterprise. Assuming that valid expectations have been established for the clients of an educational system, the question follows: To what degree have those expectations been realized? A single measure or measurement approach will not suffice.

8. What is the pertinent time span for the construction of the model as well as for its implementation once it can be validated?

It is proposed that the model, or at least each local educational setting interpretation of the model, can only be validated through the application process. Three to five years is a proposed time span for implementation at the school building level. Seven to ten years is proposed as a time span required to gain statewide acceptance and build capabilities to manage results at the state level. These time spans are estimates based upon the three-year period supported generally for development of ESEA Title III and Title IV-C projects, the five-year period recommended for initial implementation of management-by-objectives, personal experiences in program development activity, and a series of events which are perceived as necessary prerequisites to full-scale

implementation. All of these considerations are not addressed because building-level implementation is of primary concern in this treatise.

9. What supportive information systems are required for the model?

A primary supportive information system should provide routinely for determining any student's developmental profile on a timely basis. Decisions cannot be made about specific program activities which might be appropriately employed unless student needs are determined as an integral part of program development and delivery procedures. Another information system should represent a determination of the instructional competencies which exist among the members of an educational staff. Some program alternatives might be routinely eliminated or postponed for development based upon knowledge about the capacity of a staff to fulfill the expectations which a particular program might generate. One other immediately apparent supportive information system is directly related to the types of activities that might characterize an educational program. This information system would consist of plans for managing educational programs and would include expected outcomes in various areas of student development, the activities designed to promote attainment of those outcomes, and approaches to determining the degree to which expectations had been met.

Another information support system which is appropriate for consideration is a system of records which establishes physical resource availability: facilities, supplies, materials, and equipment. Utilization levels should be established so that economies could be realized

through sharing or so that increased levels could be procured or so that unnecessary items could be disposed of, traded in, sold to another user, or diverted to a greater area of need. Application of EDIIM cannot be initiated with any appreciable degree of effectiveness until the aforementioned types of information are routinely available to building level decision-makers. These statements point out why the building-level is proposed for initial implementation of EDIIM. The building level information base is considered the most immediately manageable information base and aggregate bases can be formulated from the highly specific building level bases. This is a primary reason for proposing that the fiscal resource allocation model developed during the efforts of the Tennessee Tax Reform Commission is compatible with the developmental concepts of EDIIM. Applications of EDIIM at local levels would generate the information necessary to support implementation of such a statewide finance model and setting up such a model at the state level would provide impetus for local school systems' attempts to try EDIIM concepts on a voluntary, pilot basis.

10. What are the controllable variables? (For which decision-makers?)

11. What are the uncontrollable variables? (For which decision-makers?)

There can be no conclusive discussion of control relative to the factors and levels of EDIIM. Control varies with each educational setting and must be addressed relative to each local value system, economic system, and political system.

12. Can multiple criteria be translated to a single figure of merit?

Although some decision points for the model may produce an index of performance, each index will represent only that portion of model implementation. No "single figure of merit" is proposed as producible. The educational enterprise is too multifaceted for reduction to a single figure of merit.

Does the concept of optimization vanish without a single criterion? The concept of "optimization" was not a major concept underlying the development of EDIIM. At least optimization was not considered as an ultimate goal to be attained. Optimization implies that resources were put into a support stream that given a level of investment would produce maximum benefits for a maximum number of clients of the system. A linear programming model is suggested by the concept of optimization. EDIIM posits that educational planning is anything but a linear model in its comprehensive form. No single criterion can measure the optimal success of an educational system. Optimization in a social setting cannot ignore the existence of influences by aggregating those influences into a single measure of effectiveness.

13. How would you implement the model in its intended environment?

The first tenet of implementation would be to change as little of the actual decision-making process as possible. The second tenet is a restatement of the first to some degree: start where the local school system's personnel are capable of starting. Thirdly, choose an agent for the implementation process. The superintendent's backing is important;

a school's principal should be enlisted; and a lead teacher can help the process along tremendously. When other parties of interest are included, as is encouraged, then leadership among student, parent, and community groups should be sought and encouraged, almost courted at first. The first goal is to open up the decision-making process. The second goal is to insure that all information provided through the school system is based upon sound developmental procedures and that the system does not either attempt too much or couch its reports in technical, educational terminology that quite often does not even communicate the same meaning to two educational professionals. Once the process is begun and a basis for communicating ideas has been established, the flow of the process should follow the pattern of EDIIM in a flexible way. Information should be generated as the questioning process develops and refinements are completed. Some outside technical assistance may be required, but such a possibility is provided for by EDIIM. Implementation is a continuous and a building process. Implementation can be compared to building a house that can be added to as the owners resources and capacities for development expand. EDIIM cannot be implemented in a single year. Each factor must be addressed as well as possible during each cycle of implementation and one year's work should not be expected to suffice for 20 years of growth and development.

Are costs of translating an ideal model to a workable model in the real world prohibitive? This question was not considered during this study.

14. How would you teach people to do the things that the model asks people to do?

A heuristic approach would be employed. By commencing working with parties of interest where they can commence working it is possible to operate within the framework of a model proposed by Rogers and Shoemaker regarding the innovation-decision process. The paradigm proposed by Rogers and Shoemaker consists of four functions or stages:

> 1. Knowledge. The individual is exposed to the innovation's existence and gains some understanding of how it functions.
> 2. Persuasion. The individual forms a favorable or unfavorable attitude toward the innovation.
> 3. Decision. The individual engages in activities which lead to a choice to adopt or reject the innovation.
> 4. Confirmation. The individual seeks reinforcement for the innovation-decision he has made, but he may reverse his previous decision if exposed to conflicting messages about the innovation.[76]

The stages of the model proposed by Rogers and Shoemaker are especially meaningful relative to the context of EDIIM because they are designed to

> . . . account for the major criticisms raised about the five-stage adoption process, to profit from recent researchers on the process, and to be consistent with the learning process, theories of attitude change, and general ideas about decision making.[77]

The paradigm briefly described above is considered consistent with the concepts of a heuristic approach where efforts are made to stimulate a person to investigate for himself. The process would be supported by technical assistance from outside resource persons where requested or required. State department specialists, university personnel, and local system consultants are possible resource persons. "Doing it" is proposed as the best way to learn and expectations should not be set to suggest that EDIIM will necessarily be easy or a one-shot process that is a panacea for solving a system's problems.

III. RECOMMENDATIONS

As noted earlier, EDIIM is not a recipe for change, but is a process for an educational system to follow in developing its own recipe. The recommendations set forth here are a combination of cautions and suggestions for refinement of the concepts which define EDIIM.

1. Explorations about the palatability of the terminology used to describe EDIIM are in order. The present terminology was selected because of a perceived common utilization in educational contexts. However, it is also common knowledge that the terms "evaluation" and "accountability" are not always acceptable to members of an educational community. Their meaningfulness is a constant topic for debate and discussion at conferences and throughout the literature.

2. Development of applications of EDIIM should be carried out with transition to computerized information management as a planned direction. The key to the ultimate effectiveness of EDIIM is development of a responsive information management system. But, starting "where people are" most often restricts immediate computerization. The orchestration role cited earlier should accept or initiate sharing of the responsibility for development of a responsive information management system.

3. Networks of information must be developed which minimize the basic research effort which presently must be carried out by a local school system in order to develop program alternatives that are designed to address specific educational need areas.

4. Methodical, stepwise implementation is recommended. Attempts to move everyone rapidly at an identical pace may only result in the same mistakes that have precipitated a return to individualization of instructional activity.

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[2]Hobsen v. Hansen, 269 F. Supp. 401. Peter Doe v. San Francisco Unified School District No. 653-312 (S.F. Sup. Ct.)

[3]Egon G. Guba, "The Failure of Educational Evaluation," Educational Technology, May, 1969, p. 35.

[4]Edmond H. Weiss and Roger L. Sisson, "The Student as Planning and Cost Center: An Administrative System for the 1980's," Phi Delta Kappan, December, 1974, p. 272

[5]Final Report of the Tax Modernization and Reform Commission, State of Tennessee, March, 1974. Submitted to Governor Winfield Dunn and the 88th General Assembly of The State of Tennessee, Pursuant to Chapter 746, Laws of 1972.

[6]C. Kenneth Tanner, Dewey H. Stollar and William E. Tomlinson, "A Multi-Variable Planning Model for State and Local Educational Systems." A paper presented at the Fifth Annual Symposium on Educational Systems and Planning, Harvard University, Cambridge, Massachusetts, July 15-16, 1973. Minor changes have been made in the form of the model as originally presented because of some confusion regarding what is represented by the independent variables. The model was designed to facilitate aggregate level planning for fiscal resource allocation at the state level. It remains in a developmental mode at the final writing of this treatise.

[7]Cost differentials utilized in the original explanation of the model referenced above were developed from the following sources: Richard A. Rossmiller, "Resource Configuration and Costs in Educational Programs for Exceptional Children," Planning to Finance Education, Roe L. Johns, Kern Alexander, K. Forbis Jordan (editors), National Educational Finance Project, 1971, p. 67.

Estimates for Tennessee developed by Professor C. Kenneth Tanner, The University of Tennessee, Knoxville, Tennessee. Data from The National Educational Finance Project, University of Florida, Gainesville, Florida.

[8]This will most often be determined by a legislative body.

[9]This factor will also most often be set by a legislative body.

[10]Jerry Myles Kondwros, A Developmental Study of an Educational Delivery Index for Resource Allocation Based on Regional Disparities in the Cost of Living Within the State of Tennessee, unpublished dissertation, The University of Tennessee, Knoxville, Tennessee, August, 1975.

[11]Prevalence rates are aggregate measures of the incidence of student need. Their existence facilitates planning and model testing; however, their existence also facilitates perpetuation of decision-making systems which fail to foster a recognition of the individuality of students. Complete census is the most desirable approach to obtaining accurate data on the needs of students as individuals.

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[15]Stufflebeam, op. cit.

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[19]William E. Tomlinson and C. Kenneth Tanner, "A Multi-Variable Approach to the Allocation of Fiscal Resources," Educational Planning, Vol. 1, No. 4, March, 1975, p. 21.

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[22]Kaufman, op. cit., pp. 1-2.

[23]Ibid., pp. 14-15.

[24]Ibid., pp. 132-122.

[25]Ibid., pp. 8-9.

[26]C. Kenneth Tanner, mimeographed handout, EA&S 5774, Spring, 1972.

[27]C. Kenneth Tanner, Designs for Educational Planning, A Systematic Approach, Lexington, Massachusetts, D.C. Heath, 1971, pp. 19-22.

[28]Egon G. Guba, "The Failure of Educational Evaluation," Educational Technology, May, 1969, p. 35.

[29]Kaufman, op. cit., pp. 13-23.

[30]An even more expanded version of this model has been operationalized by the Innovative Programs Staff in the Tennessee State Department of Education.

[31]Kaufman, op. cit., pp. 28-30.

[32]Ibid. , p. 136.

[33]Ibid. , p. 137.

[34]Harry J. Hartley, Educational Planning--Programming--Budgeting, A Systems Approach, Englewood Cliffs, Prentice-Hall, Inc. 1963, p. 23.

[35]James F. McNamara, "Models and Their Utility in Educational Planning," Education Tomorrow, ISEP Journal, May, 1972. (The secondary reference was cited by McNamara from Locational Analysis in Human Geography, New York: St. Martin's Press, 1966 by Peter Haggett.), p. 7.

[36]Hector Correa (ed.), Analytical Models in Educational Planning and Administration, New York: David McKay Company, 1975, p. 1.

[37]McNamara, op. cit., p. 6.

[38]Ibid. , p. 15.

[39]Frank W. Banghart and Albert Trull, Jr., Educational Planning, New York, New York: Macmillan Company, 1973, p. 296.

[40]Ibid., p. 297.

[41]Ibid., p. 297.

[42]McNamara, op. cit., pp. 7-8.

[43]Ibid., pp. 8-9.

[44]Banghart and Trull, op. cit., p. 297

[45]Ronald G. Havelock, "The Utilization of Educational Research and Development," British Journal of Educational Technology, Vol. 2, No. 2, May, 1971, pp. 84-87.

[46]Correa, op. cit., p. 3.

[47]McNamara, op. cit. This might also be considered an appropriate process guide for constructing a satisfactory model. If the rules are available ahead of an act and the modeler engages himself in model development, then applies the rules, then it is a test of problem solving ability rather than an application of existing knowledge. Such an approach would be contrary to the basic tenets of this treatise.

[48]Stufflebeam, op. cit., p. 6.

[49]The following constitutes a partial listing of the terminology common in the realm of individualized instructional concepts: computer assisted instruction (CAI); computer managed instruction (CMI); individually prescribed instruction (IPI); individually guided education (IGE); diagnostic-prescriptive approaches; programmed learning packages; differentiated staffing; team teaching; open-access education; open-door policy; multiple entry/exit; personalized information systems; continuous progress; criterion-referenced testing; performance objectives; performance contracting; and competency based programs.

[50]Final Report of the Tax Modernization and Reform Commission, State of Tennessee, March, 1974.

[51]Stufflebeam, op. cit.

[52]A decision situation was defined as "a set of alternatives" earlier. Each alternative is considered to have components.

[53]A specific attempt has been made to adhere to the emerging terminology of educational planning and evaluation disciplines. Also, a specific effort was made to adhere to the concepts which have emerged as a result of the developmental work of the ESEA Title III Staff for the State of Tennessee.

[54]EDIIM, as represented in Figure 2.5 (p. 34) is more closely aligned in appearance to an illustration of the computer terminology "a three dimensional array." Each dimension or factor when analyzed relative to its various levels becomes progressively more complex and complicates both comprehension and analysis. But such a representation is a more accurate model of the decision situation which actually exists than either the process model displayed in Figure 2.3 (p. 21) or separate discussions of each factor which provide no explicit recognition of the influence of the other two factors. Nevertheless, the term matrix is considered to more closely represent the interactive concepts of EDIIM because each cell of information represents a two, three, or possibly four or more way interaction in the decision situation described by the information at hand.

[55]McNamara, op. cit., p. 15

[56]A dramatic example is the busing issue which was a mandated standard for system activity. A more realistic example is the situation where a guidance counselor or teacher advises a student in a manner which is not supported by the student's parents

[57]Tennessee's "839" legislation which mandated integration, where possible, of handicapped students into the "regular" classroom failed to recognize that teachers had not been trained to handle the special problems that would arise. No funds were provided to facilitate teacher development in that situation. The results are not yet in as regards who will suffer most from that unplanned, unfinanced decision.

[58]Rita Dunn and Kenneth Dunn, "Learning Style As a Criterion for Placement in Alternative Programs," Phi Delta Kappan, December, 1974, pp. 275-278.

[59]In the spending spree of the 1960's when voters felt good about education and were passing bond issues right and left and the Sputnik "scare" dictated that math and science were "the" areas in which students should study and work, many new facilities were constructed with science labs and other manifestations of confidence in the directions for programs which were "right" for an ever expanding economy and body of students. Student populations have declined; integration has prompted consolidation of student bodies into facilities which are too small; population shifts from cities to suburbs have placed increased demands on buildings which are too small; students are not learning to read; demand for standard science instruction has declined appreciably; vocational education has become the "new panacea"; in short, many facilities are already either outdated or standing empty. A major investment of only a decade ago cannot be justified, because many millions of dollars were spent while the iron was hot for striking. This note is provided as a caution not an indictment.

[60]Stufflebeam, op. cit., pp. 6, 9-12. Although Stufflebeam does not include interpretation as a component of information processing, it is considered a distinct activity to be performed prior to reporting and set forth relative to each decision alternative. Leaving all interpretation of an analytical effort to a decision-maker is not considered technically sound regarding the model proposed in this treatise.

[61]It may be helpful to the reader to review the nature of school system decision makers as set forth in Chapter I.

[62]1975-1976 Rules, Regulations, and Minimum Standards, Tennessee State Board of Education, Nashville, Tennessee, July, 1975, p. i.

[63]Ibid., p. 4.

[64]Such a concept is consistent with the Getzels-Guba model for social interaction in an institutional setting. That model recognizes both collective and individual worth and objectives as being operationally expected.

[65]The tools considered most appropriate and most often employed are opinionnaires, questionnaires, and personal interviews. Since this guide will be general in nature, actual construction of samples of these various tools will be left to pedagogical and actul situation applications.

[66]Kaufman, op. cit., p. 45.

[67]Ibid., p. 45

[68]A frequent example of this situation, the split reaction, can be found when legislators in Washington champion public education causes but send their own children to a private school or insure that their residence is in one public school district as opposed to another.

[69]California is a frontrunner in this movement at present. A funding system that rewards community involvement in planning programs for early childhood education has been operating with success and Governor Brown has discussed expansion. (Statements to this effect were made during a "Choices in Education" conference held in Nashville, Tennessee on April 30 through May 1, 1976. Those statements were made by Davis Campbell, a member of the staff of the Superintendent of Education for California, Wilson Riles.)

[70]Information cells are repositories for decision information to be utilized in the application of the EDIIM model. Those cells should "hold" all pertinent information whether qualitative or quantitative and whether subjective or objective. Such a set up would facilitate maintaining consistency during developmental, operational and maintenance activities affecting program delivery. Placing the information in an electronic data processing configuration could provide an additional check on consistency and improve timing for information processing and the reporting of results.

[71]The term "individual need areas" is employed because needs can be shared by groups or manifest in single individuals. The implications are that "individualized" instruction can be delivered one on one, to pairs of individuals, or to groups of three or larger if each person in the group has a shared need.

[72]EDIIM is intended to be a model to facilitate problem-solving. When engaged in problem solving activities it is difficult to structure from a sequential standpoint beyond some minimum referent. The referent in the instance of EDIIM is the school system's client as represented by

"Program Element (PE_{i1}): System Client (Student)." Therefore, once the primary referent has been established, the user of EDIIM should alter the sequence of addressing each factor and level to correspond to the situation under consideration.

[73]Educational Evaluation and Decision Making, Phi Delta Kappa National Study Committee on Evaluation, F.E. Peacock Publishers, Inc.

[74]Excerpt from ESEA Title IV Guidelines and Instructions for FY '76, Tennessee Department of Education, Sam H. Ingram, Commissioner. This section was written by Bill Tomlinson, Evaluation Specialist, Innovative Programs Staff.

[75]Everett M. Rogers and F. Floyd Shoemaker, Communication of Innovations, A Cross-Cultural Approach, New York: New York Free Press, 1971, pp. 99-104.

[76]Ibid., p. 100. The traditional view of the innovation decision process, called the "adoption process," was postulated by a committee of rural sociologists in 1955 as consisting of five stages: (1) awareness stage; (2) interest stage; (3) evaluation stage; (4) trial stage; and (5) adoption stage.

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