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ABSTRACT

Described are two new models for educational evaluation with emphasis on special education: the Consumer Model for Program Evaluation and the Synthesis of Abilities Model for Pupil Information. It is explained that the Consumer Model for Program Evaluation covers the governance structure of education and emphasizes the pupil as the focal point with the chief features being responsibility, budget, trained people, reporting, use of information, design, measures, and basis for evaluation. The Synthesis of Abilities Model for Pupil Information is noted to be applicable to all pupils in all learning situations with the chief features being abilities, spheres of response, analyses, and synthesis. Ten abilities are identified in five spheres of performance and quantitative and contrastive analyses are discussed. Emphasis in the model is placed on pupil performance elements in three phases of learning: preparation, acquisition, and use. Learning is defined as a measurable, verifiable change in performance. Program evaluators and managers at all levels of the governance structure of education are encouraged to work with consumers to clarify their information needs, specify the evidence required, and provide the resources necessary to supply accurate, timely, and helpful information. (Author/DB)

Program Evaluation and Pupil Information in Special Education

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PREFACE

Who wants to know about the impact of education programs upon the children and youth of our communities, states, and nation? Who has the answers to such questions as these: Is my child improving in reading? Are our youth prepared for finding and holding down jobs? Do young children with exceptional needs benefit from early school programs? Is it possible to evaluate special education programs?

The California State Department of Education evaluates publicly supported educational programs and assists local educational agencies, parents, and communities in developing the capability of improving their programs through timely, verified, helpful program evaluation.

As the California Master Plan for Special Education was being developed, the need for special education program evaluation was translated into action. Project SEEM (Special Education Evaluation Models for California) was created by the California State Department of Education, and it was funded under the Education of the Handicapped Act, Title VI-B, Public Law 91-230, from July 1, 1972, to June 30, 1975.

Under the direction of Margaret Scheffelin, Project SEEM has acted as a catalyst in bringing about cooperative interchange between program evaluation, special education, and state and local levels of education. In April, 1974, the Operational Project Audit Team recommended to the Department that the third and final year of Project SEEM be singularly devoted to the production of a document describing critical elements which must be considered in evaluating special education programs. This publication, Program Evaluation and Pupil Information in Special Education, is the result of the audit team's recommendation.

This document is a departure from the usual publications of the State Department of Education. Typical consumers of Department publications may approach their reading of this document looking for guidelines, procedures, and directives. It is the intent of this document to stimulate, not to prescribe or proscribe. Following the recommendations of the audit team, the final chapter contains seminar questions related to the models presented in the body of the document. The Consumer Model for Program Evaluation and the Synthesis of Abilities Model must be considered together, although they may be studied separately.

Appreciation is extended to the many persons throughout California and the nation who were involved in Project SEEM activities throughout the three years of its operation. Special appreciation is extended to Russell Forney and Mary Campasano, of the Department, and to the many persons who reviewed earlier drafts of this document.

As we press on with the exciting challenge of working and living with children, we find the formula for improving the nature of the human race--total commitment to the education of all our children. The key questions are these: Are pupil abilities discovered, enhanced, and maintained as a result of what we do? How do we know?

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CONTENTS

LIST OF FIGURES

CHAPTER I

Introduction to Program Evaluation in Special Education

Purpose and Overview

Special education program leaders are now gearing up to provide accurate, understandable, and timely information to decision makers, including themselves. Information about pupil performance and change can be used to meet the requirement of accountability as well as to improve programs for children and youth of all ages who require special education.

This document is designed to stimulate special education program leaders at all levels of education in improving their programs through program evaluation and pupil measurement. The document is intended to be universal and to apply to all education programs enrolling special education pupils, regardless of location or legal authorization. The document is not intended to be an operational manual.

This document contains five chapters covering program evaluation and pupil information and presenting two new models for discussion and adaptation for use in education programs. The new models are the Consumer Model for Program Evaluation and the Synthesis of Abilities Model for Pupil Information. Each model has the pupil as the focal point. The final chapter contains suggested seminar questions for use by discussion groups.

Program Evaluation is the process of agreeing to, describing, measuring, reporting, and judging those elements which affect management decisions. In education the management begins with the teacher and includes all the school staff as well as the family or guardian. In special education the "management" often includes professionals in health fields and other disciplines such as engineering. Evaluation links together goals, needs, objectives and outcomes by providing the answers to critical management questions, chief among which is: Who wants to know what?

Description of pupil performance and measurement of pupil change are the chief obstacles to program evaluation in special education. Deviation (differences between pupils as a group) and variability (differences within individual pupils) are the characteristics which create measurement and reporting problems for special education program leaders and evaluators. Focus on pupil abilities over a period of time appears to be the one way of dealing with the problems of deviation and variability. Direct measures of elements of pupil performance in educationally relevant tasks are recommended in the three phases of learning: preparation, acquisition, and use. Learning is defined as a measurable, verifiable change in performance.

Literature Review

There exist three bodies of literature bearing on the topic of program evaluation in special education. The three are regular education program evaluation, special education, and special education program evaluation.

Each of these bodies represents a different set of professionals with their own experiences and reporting to their own constituents in their own terms.

Regular education program evaluation literature on designs and measures has not been found directly useful to special education programs. Two works, however, have been helpful in the development of this document, Stake (1967) and the California State Department of Education (1974). Stake emphasizes the importance of description and judgment. The Department of Education's handbook emphasizes the multiple uses of pupil and program information in educational program planning, operation, evaluation, and reporting.

Special education literature contains an immense number of publications in the area of pupil assessment and pupil measurement. All of the publications put together have been of no use in conceptualizing a framework for special education program evaluation and pupil measurement to encompass the range of ages (from 0-21 years) and the range of pupil characteristics in special education programs. In addition, the mass of technical terms serves to confuse or to infuriate the reader or listener. (Scheffelin, 1969)

The special education program evaluation literature is recent, sparse, and marked more by description of the problems rather than by suggested solutions or approaches. The approaches are primarily aimed at short-term new projects rather than at continuing programs. Examples of approaches are Meierhenry, (1969) and Gallagher, Surles, and Hayes, (1973). Examples of problems are Prager (1971), Jones (1973), and Nomos (1974).

In all three bodies of literature, evaluation has been treated as an end to itself, not as a part of a whole cyclic process. More attention has been given to the technical aspects of designing and conducting evaluation studies than to the information-using consumers of evaluative information.

Background

Program evaluation and pupil description in special education have taken different forms throughout its history. The different forms can be considered as protest, testimonials, and testimony. All forms can be occurring at the same time. Program evaluation began with the pleas of parents before local and state boards and legislators to obtain programs

for their particular youngsters for whom no program existed. Program evaluation in special education then moved to the testimonials of parents as they sought continuance and expansion of those programs. Too often parents were so pleased at the provision of a program, any program, that they did not press on for an improved program. New parents accepted the program as it was and until recently, tended not to demand program improvement. Program evaluation has taken the form of testimony in courts as parents sought access to appropriate programs or egress from and non-entrance into inappropriate programs. These activities were, by their nature, sporadic and aimed at immediate change in education programs. Program evaluation in special education is moving past the use of tests and test scores as indicators of program quality and pupil success.

Pupil description has taken different forms also as parents and professionals attempt to provide appropriate programs for individual pupils. Technical terms go out of favor and drop from usage; some by common consent, others by consent decree. Semantic overlays creep in on any term as pupil characteristics begin to be attached to the term. More terms exist in the assessment literature than in the instructional literature. Assessment terms usually need interpretation and translation to nonprofessionals. The advent of due process procedures is a move toward laicizing educational decisions and educational terminology.

Statement of the Problem

Program evaluation and pupil description in special education must move from external, intermittent, unbudgeted, and disability-specific to internal, continual, funded, and pupil performance-generic.

Principles of Program Evaluation in Education

The following statements have been generated from the results of several years of working intensively with evaluation and program staff in a variety of special educational programs at school, district, state, and federal levels. Program managers have successfully adopted these principles as fundamental assumptions in planning, conducting, and using the results of program evaluation. The principles are pertinent to all education programs.

1. Evaluation in education is the process of agreeing to, describing, measuring, reporting, and judging those elements in education which affect management decisions on program improvement at pupil, local, state, and federal levels.

2. The purpose of program evaluation in education is to improve, not to prove or to reprimand.

3. Evaluation is an integral aspect of planning, operating, and modifying programs. Evaluation and planning are inseparable.

4. Variability in the performance of pupils poses measurement and reporting problems for program and evaluation staffs, but that variability does not exempt education programs from the requirement of accountability.

5. An updated program description, including comparison of old baseline pupil data with new data, is an essential form of program evaluation.

6. The test of a program description is: Is it described in operational terms sufficient to permit on-site verification and judgment about process and outcomes?

7. It is an indefensible waste of resources to gather, analyze, interpret and report unreliable data or to require data gathering without a plan for its use.

8. In human beings learning, growth, and development are never straight lines. They are sporadic rather than continuous; they go down as well as up.

9. Useful research information is a product of carefully described program operations. Research can be most useful to the researcher and to others when the research is designed by and with program staff to yield timely and accurate information on specific program elements. Sound program evaluation designs point up individual pupil effects which would have been hidden by averaging group results.

10. Measures of low reliability or unknown reliability, whether tests, checklists, scales, or inventories, yield little useful information. Yet that unreliable information is often secured by, or provided to, incompletely trained staff, with an unknown effect on pupil assessment, assignment, instruction, and reassignment. It is better to train observers than to increase the number of unreliable measures.

11. Informed judgment can yield reliable data about pupils and programs, given a consensus on standards and a set of standard procedures for exercising judgment.

CHAPTER II

The Consumer Model for Program Evaluation

This chapter discusses consumers of evaluation and presents the consumer model of program evaluation developed for this document.

Consumers of Program Evaluation

As alluded to earlier in the preface, the program evaluation literature has emphasized the procedures and the doers of evaluation rather than the consumers of evaluation and evaluative information. In the model presented in this document, all persons in the governance structure of education are considered consumers. Figure 1 presents the chief elements of the governance structure of elementary and secondary education. The elements are the pupil, parents, local school, school district, school board, chief state school officer, state board, governor, Legislature, the President and the United States Office of Education, the Congress, and the courts. The interrelated nature of the governance structure is emphasized in the schematic chosen for its portrayal. The pupil is at the center of the schematic, signifying the point of interaction of the elements as well as the reason for the existence of the educational elements of the governance structure.

It should be noted that although institutions of higher education are important to education and particularly important in special education, they are purposely omitted from this discussion. To include them would be beyond the scope of this document, which is aimed at the public schools.

Two questions should be asked about the consumers: (1) Who are they? (2) Under what conditions will the consumers use program evaluation? These questions are answered below in a general way. A program leader must discover particular consumers' requirements for evaluation and information. A program leader should obtain specific questions which consumers have about the programs, and, what is equally important, the kind of evidence consumers will accept as answers to their questions.

A. People use program evaluation, acting individually, or collectively as members of a group. Five roles are distinguishable: (1) program staff, such as teachers, administrators, support staff, at local, state, and federal levels; (2) parents or guardians of the pupils; (3) community representatives, such as employers of pupils and graduates, governors, legislatures, funding agencies, boards of education; (4) pupils, enrolled in special education programs, or graduates, or former enrollees; and (5) evaluators, working with or for other consumers.

B. Consumers, that is, people and institutions, will use program evaluation and continue to use it, if and only if certain conditions are met:

1. It's helpful.
2. It's done in time.
3. They helped design it so it gives them answers to questions they asked, in language they understand.
4. They know where the numbers come from.
5. They trust the evaluators.
6. They agree with the purpose; program improvement for improved pupil performance.
7. Any external evaluation is independent of the administrative supervision of the program and is free from conflicts of interest.
8. Any internal evaluation is negotiated by the administrative supervision of the program with the program operators.
9. They know it's not busywork because it grows out of program operation (although they know it's still work).
10. Money and time are available, and help is there when they need help.

Essential Features of the Model

Eight essential features are the building blocks of the consumer model for program evaluation developed for this document. As shown in Figure 2, reading from the bottom to the top, the eight features are responsibility, budget, trained people, reporting, use of information, design, measures, and basis for evaluation. The model is applicable to all levels of education and in all elements of the governance structure.

Education program leaders and other persons in the governance system can use the consumer model presented in this chapter as a means of discussing their expectancies for program evaluation.

Examples of the use of the consumer model are given in Figure 3. Here the essential features are applied to two elements of the governance structure, the local school and the Legislature. Note the reciprocal relationships throughout, typified by the reporting feature. The Local School element must provide concise, understandable reports, keyed to consumer requests

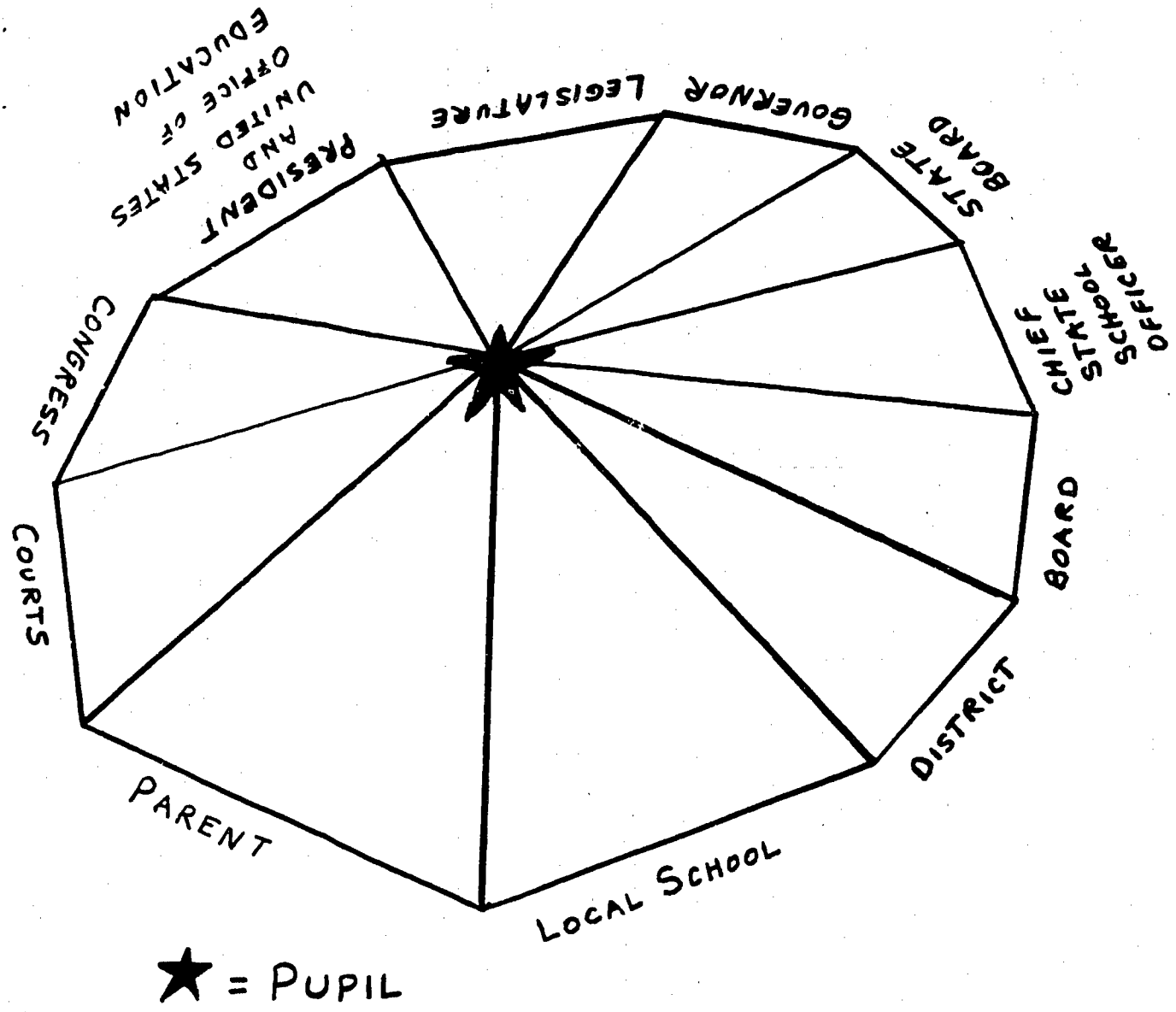

FIGURE 1

SCHEMATIC OF THE GOVERNANCE STRUCTURE OF EDUCATION

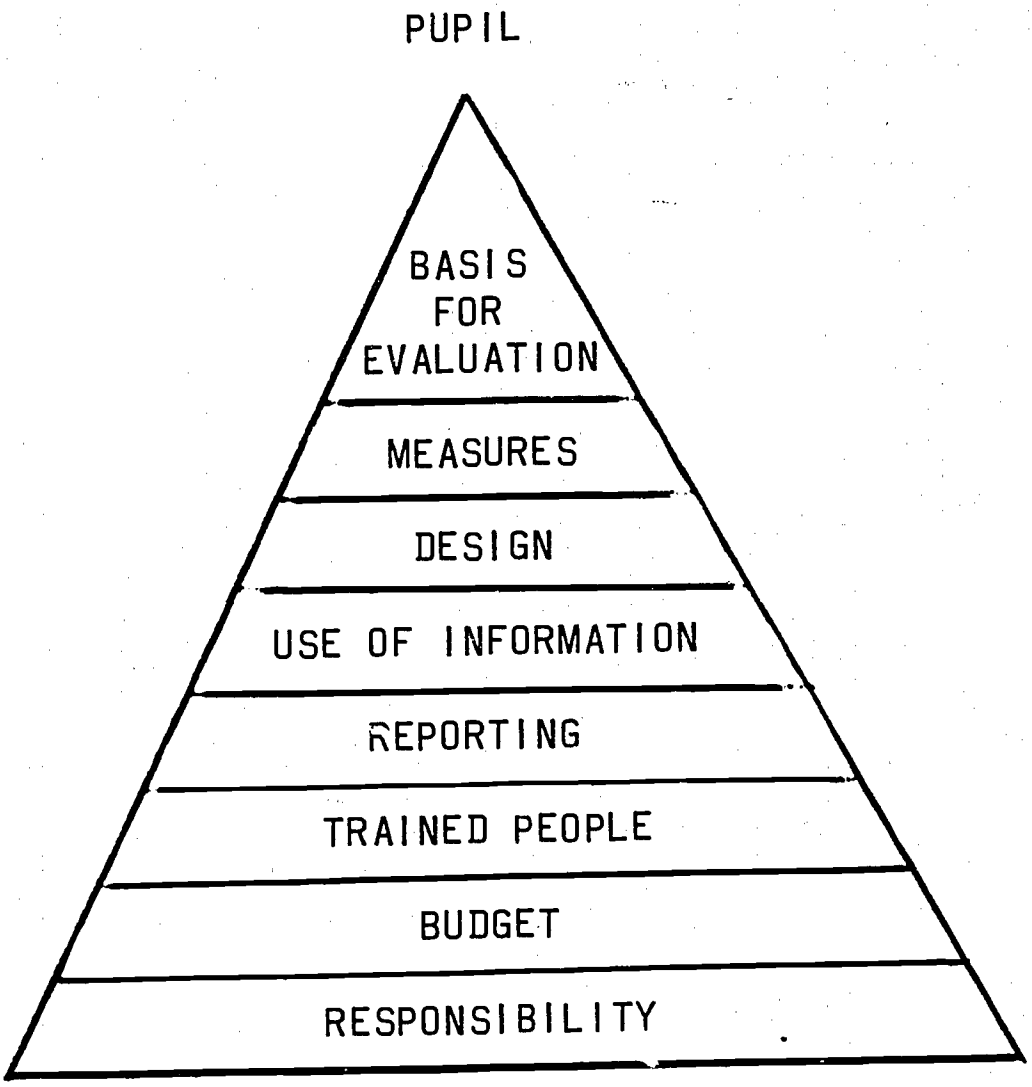

FIGURE 2

ESSENTIAL FEATURES OF THE CONSUMER MODEL FOR PROGRAM EVALUATION

FIGURE 3

APPLICATION OF THE CONSUMER MODEL FOR PROGRAM EVALUATION

ESSENTIAL FEATURES	LOCAL SCHOOL	LEGISLATURE
Responsibility	Provide accurate and timely information to consumers including themselves	Provide useful and timely feedback to providers and consumers
Budget	An integral part of the program budget with discernible time, facilities and resources	Recognition that program evaluation is continuous and is a necessary part of program operation and management
Trained People	People who have learned to - look at and listen to pupils - separate data from inference - record, retrieve, and communicate pupil information People who accept pupil measurement as their responsiblity	People and institutions who have learned to accept both positive and negative results as useful results. People who accept the fact that human change is not linear.
Reporting	Concise Understandable Keyed to consumer requests Related to program objectives	Explicit, answerable questions. Resources supplied to secure adequate data to arrive at conclusions.
Use of Information	Modify school programs to fit changing pupil abilities. Report to other consumers.	Judge school programs. Agree to demonstrated need for revisions. Supply required resources.
Design	Related to pupil abilities and program objectives. Created with the people who know the pupils.	Agreed to in advance of program operation.
Measures	Pupil performance in terms of abilities in educationally related tasks.	Consensus on validity of measures and acceptability of evidence.
Basis for Evaluation	Description of education program. Measurement of pupil change in abilities	Description of program results in terms of pupil abilities.

and related to program objectives. The Legislature element must provide explicit, answerable questions and supply resources to secure adequate data to arrive at conclusions.

Education program leaders can use the features of the model as the basis for staff self-study of their current program evaluation efforts. Program leaders who discover strong points in the program evaluation efforts can be justifiably proud. Chances are, though, that most programs will have one or more weak areas. A rule of thumb is, "If it's not written down, and handy, it's probably not being done." Information and procedures in peoples' heads usually stay there and are not systematically passed on. A leader should inquire about these points, not only with the program staff but also with other people inside and outside of the school.

Chances are that little or no reliable, verified baseline data are available in terms of pupil abilities and performance on educationally related tasks. If so, the education program leader must shift emphasis from program evaluation to program description and must gather educationally relevant pupil data. The Synthesis of Abilities Model presented in Chapter Four will provide a simplified framework for thinking about and organizing pupil data.

CHAPTER III

Pupil Information in Special Education

Education exists to enhance the performance of pupils. Schools are accountable to education consumers for accurate and timely reports of the impact of education programs upon their pupils. Education leaders are searching for new ways of describing pupils and presenting pupil information.

Statement of the Problem

In the absence of a unifying framework for organizing pupil performance information, education program staff tended to remain in their areas of professional experience. They retained their professional disciplines' terms and the ways of thinking about pupils represented by their disciplines. Pupil description has been discipline or categorically specific, and primarily deficit-oriented.

Few human beings make a living by exhibiting their performances in their deficit areas, a fact well understood by employers. Pupils, parents, school staff, and the community want to know what pupils can do, their abilities, along with clear and understandable descriptions of what the pupils can't do, their deficits. Communication within the governance structure is made more difficult when no common set of terms exists for describing pupils and reporting the results of measuring pupil change. Even when a common set of terms exists, the terms haven't always meant the same things to different members of the governance structure.

Education consumers are not satisfied with the pupil information currently available. Measurement and reporting of program impact must move from eligibility and attendance data to information about pupil performance and change. The deviation and variability of special education pupils must be taken into account in the development and use of new pupil information structures.

Background

Historically, two types of pupil information were collected by schools, eligibility and attendance. Attendance information was reported; eligibility information was not. Eligibility was presumed from the reporting of attendance.

Neither eligibility nor attendance was necessarily pupil performance information. Eligibility has related to individual pupils. Attendance data has been considered an aggregate for programs.

Eligibility information has been used primarily to make decisions on the enrollment of individual pupils into existing educational programs, regular and special. Attendance information has been used to make decisions on the amount of money to be requested, received, and expended by the program administrators at the various levels of education: local, state, national.

Eligibility information required for enrollment in regular education programs has typically included three factors: age, ability to profit from instruction, and absence of harm or danger to other pupils. Each of the three factors has required a different type of evidence. For age, written proof of birth or existence has been required. For ability to profit from instruction, school staff judgment has typically been exercised at the building site level. For absence of harm or danger to other pupils, school staff judgment or medical opinion has typically been required.

In special education, eligibility information has been necessary for enrolling pupils. Eligibility information was of various kinds, obtained by a variety of methods, and described in a variety of terms and conceptual frameworks. Most eligibility information has not been directly related to pupil performance in educationally relevant activities. Eligibility information was not usually translatable into instructional information. The measures used to determine eligibility typically did not lend themselves to measuring changes in pupil performance, especially over long periods of time or developmental phases. Furthermore, certain measures had little direct relationship to education, although the conditions they measured had a great deal to do with the educational need of the pupil. Many measures of eligibility had little to do with the instructional objectives for an individual pupil or with the goals and objectives of a special education program.

Enrollment procedures for regular and special education programs, contained in a variety of written laws and uncodified practices, continue to be the subject of legislation and litigation. Litigation continues across the country on behalf of persons excluded by law, public policy, or local practice from eligibility for enrollment in any form of public education.

Attendance information has typically included time spent on the school site or time in directly supervised instruction off-site. A bewildering array of time periods and conversion formulas exists across the nation. Attendance information has not been systematically used as one basis for program planning and program evaluation.

Program impact information has been generated and reported in a variety of formats. The most typical pattern has been an individual pupil report card or conference with the parent and a district or state-wide aggregation of test score data for large numbers of the pupils tested. It has become increasingly apparent that no segment of society willingly accepts permanent custody of the lowest achievement levels.

No single measure, no single dimension could adequately convey the complex information about infants, children, and youth, ages zero through twenty-one, with a wide range in all aspects of growth and development. Examples of incomplete dimensions were age, developmental level, intelligence, height, weight, achievement, and sensory capacity. People didn't arrange themselves neatly and linearly. Attempts to force a linear progression led to artificial arrangements in which events are allegedly linked to numbers, but interpretation of the numbers was risky because numbers didn't know where they came from. The danger arose because numbers, once stated, seemed to be reified and took on a life of their own.

In the absence of reliable and valid measures of pupil performance and change in the areas of educational emphasis, program staff tended to adopt one of three possible courses of action. One course was to use inappropriate or low-power measures, ignoring (or not aware of) the limitations on interpreting the results. Another course was to create and use measures of unknown reliability. Either way, the "numbers didn't know where they came from." The third course of action was to avoid measurement. All three courses of action led to little or no possibility of demonstrating and verifying program impact on pupils.

Principles for a Structure of Pupil Information

The following statements have been developed by Project SEEM from its experiences in working with consumers of pupil information. These statements have been used as criteria for the development of a new structure for organizing pupil information, presented in Chapter IV. The primary emphasis in the statements is on the consumers of pupil information. As shown in Chapter II, the consumers begin with the pupil and extend to the entire governance structure of education, including the courts.

To be useful to all consumers, a structure for organizing pupil information must meet all these criteria:

1. Enhance communication among all consumers of education and program evaluation.

2. Emphasize the abilities of pupils.

3. Be applicable to all pupil study procedures from screening and referral to exit and follow-up.

4. Enable measurement of current pupil performance.

5. Increase the descriptive power of existing pupil measurement procedures.

6. Assist in selecting instructional areas of emphasis.

7. Promote the setting of feasible instructional objectives.

8. Be useful in predicting the time period for the attainment of pupil objectives in the selected curriculum.

9. Enable the measurement and reporting of pupil change.

10. Be verifiable by trained observers and listeners.

11. Provide the basis for documentation of pupil progress.

12. Promote maximum use of existing pupil information.

13. Be usable by all professional disciplines related to education.

14. Be universal in its applicability to all pupils in all instructional settings.

15. Recognize individual differences and capitalize on deviation and variability.

16. Recognize the role of neurophysiology in human action.

17. Emphasize the essential focus of education on instruction and assessment, and the focus of the pupil on learning and performance.

18. Be aggregatable for program planning, operation, evaluation, and revision.

19. Be parsimonious: sufficient, consistent, and efficient.

These principles can be used by readers of this document, education program staff and other consumers in studying the new Synthesis of Abilities Model presented in Chapter IV.

CHAPTER IV

Synthesis of Abilities Model for Pupil Information

It is the purpose of this chapter to present a new and simplified structure for organizing pupil information, the Synthesis of Abilities Model. The model emphasizes the pupil's ability to learn, introduces the notion of pupil performance elements in the three phases of learning as a unit of analysis in education, and highlights trained human judgment as a measuring instrument.

Delimitations of the Model

The Synthesis of Abilities Model takes into account the distinctions between the actions of human performance and external observations of that human performance.

The distinctions are shown in the universally used modal verb forms. In English, can, will, and do are the modals of chief interest in describing human performance in the Synthesis of Abilities Model. (It is recognized that additional modals are applied to human performance. Examples are may, might, should, would, ought.)

Every human action is a blend of can and will. The can stems from the human body, the will stems from the human person. Both can and will are involved in human performance. The external observer observes an action as a do, whether the observer is a person or a calibratable instrument such as a grip-strength meter.

The modal verbs can, will, and do are critically important in at least two ways. First, the modal verbs convey a sense of choices open to the actor, the person performing the action. In fact, the choice may not be open in all cases. For example, "hand-preference" is a two-choice situation only for people who have two hands. Second, the negative forms of those three modal verbs can't, doesn't, and won't, convey a complex set of meanings to the reader or hearer. For example, doesn't is interpreted as can't by one observer and as won't by another observer. Those differing interpretations may make large differences in the conclusions reached and the recommendations offered by the original observers. The differences can easily be magnified, by time and distance, to other receivers of oral or written reports who do not have access to the primary observation data.

The Synthesis of Abilities Model is focussed on the pupil and on information about the pupil's abilities as shown by the pupil's performance. The pupil is considered in the role of an acting and responding human being who transduces energy. The model is limited to those aspects of a pupil's life which are public and verifiable. This is not to deny that a private world exists of intention and reflection. But enforcing self-report from the pupil is tantamount to an invasion of privacy.

Structure of the Synthesis of Abilities Model

An overview of the Synthesis of Abilities Model is displayed in Figure 4. There are four main divisions: Ability, Sphere of Performance , Analysis, and Synthesis.

Ability is the first division of the structure of the Synthesis of Abilities Model. Ten abilities have been identified. They are the ability to (1) transmute substances; (2) transduce energy; (3) process sensation; (4) control body movement; (5) process symbolic information; (6) relate; (7) communicate; (8) survive; (9) hold one's own as a peer; and (10) learn.

Sphere of Performance is the second division of the structure of the Synthesis of Abilities Model. Five spheres within which pupils act and respond have been identified in Figure 4. The spheres are (1) the internal environment; (2) the external environment; (3) other people; (4) society; and (5) instruction. The spheres overlap and are not mutually exclusive.

Analysis is the third division of the structure of the Synthesis of Abilities Model. Two types of analyses are included, quantitative and contrastive. Each type of analysis is applied to information about pupil abilities in all spheres of performance. Quantitative analyses are done in measuring or counting the critical elements of a pupil's performance. Contrastive analyses are done in comparing the measurements with previous measurements on the same pupil or with other measurements of other pupils.

Synthesis is the fourth division of the structure of the Synthesis of Abilities Model. Synthesis includes the aggregation and integration of the analyzed information on pupil abilities from the performance elements in each of the spheres of performance. Synthesis prevents isolation of information and omission of important areas of a pupil's life. Synthesis promotes the communication and reporting of changes in pupil abilities to all interested parts of the governance structure of education.

The model will be discussed in detail in three sections: (1) Abilities and the Five Spheres of Performance; (2) Analysis; and (3) Synthesis.

FIGURE 4

SYNTHESIS OF ABILITIES MODEL FOR PUPIL INFORMATION

ABILITY	SPHERE OF PERFORMANCE		ANALYSIS		SYNTHESIS
Transmute substances Transduce energy	I	The internal environment	QUANTITATIVE	CONTRASTIVE	
Process sensation Control body movement Process symbolic information	II	The external environment			
Relate Communicate	III	Other people			
Survive Hold one's own as a peer	IV	Society			
Learn	V	Instruction			

Section 1: Abilities and the Five Spheres of Performance

Each of the ten abilities has been assigned to one of the five spheres of performance.

Sphere I, The internal environment. Two abilities have been identified: the ability to transmute substances and the ability to transduce energy.

Sphere I, the internal environment, is within the human body. In this document, the pupil is not considered a learning machine. Rather, the pupil is considered as a human being who transduces energy in time and space. The specifications for the human body and its neurochemical working are incompletely known. However, lack of complete knowledge should not be allowed to prohibit the use of the partial knowledge accumulated over the years in neurophysiology.

All human actions depend on energy generated within the body. To generate energy, the human body transmutes substances taken into it. Examples are the complex interactions between the endocrine glands, the digestion of food, and the use of oxygen to ignite carbon. (How many persons have ever thought of themselves as miniature chemical laboratories and furnaces?)

To keep alive or to maintain growth and development, the human body must transfer energy within itself. Examples of the energy transferred are the electrical impulses of the central nervous system and the hydraulic pumping of the circulatory systems.

Performances in Sphere I are internal actions, functions, and/or reactions. Examples are typically physiological, such as temperature, sleep, electrical activity, or joint extension. Sphere I is involved in studies pursuing the educationally important interactions between internal environmental substances such as medication and Sphere II abilities such as moving body parts.

Sphere II, The external environment. Three abilities have been identified: the ability to process sensation, the ability to control body movement, and the ability to process symbolic information.

Sphere II, the external environment, is outside of the human body. The physical environment includes energy, objects, space and time. In this document, the pupil is not considered to be a responding machine whose every action is controlled by external factors. Rather, the pupil is considered as a human being who tranduces energy, takes up space, acts on objects, and exists during time.

Each of these aspects of the external environment is differentiable. Energy is defined as light, sound, pressure, heat, and aroma. Objects are defined as countable things having contiguous surfaces and mass, such as trees, air, cars, pencils, dogs. Space is defined as the field in which objects rest or move. Time is defined as the succession of cyclical or predictable events.

The ability to process sensation includes the functions of seeing, hearing, feeling touch, feeling movement, feeling temperature, smelling, tasting, knowing where one is in space, feeling change in location.

The ability to control body movement includes the entire musculature under the control of the human being. Once there was thought to be two separate systems, one "autonomic," not subject to voluntary control, and one "voluntary." The separateness has never been complete, and evidence on the extent of voluntary control over "autonomic" systems is accumulating and gaining acceptance. Muscles make the body parts move, literally, from head to toe. Muscles also make the movable body parts not move. Control of a myriad of muscles enables the person to make vocal sounds, snap fingers, hold a pencil or paintbrush, chew or swallow food, breathe, focus the eyes, turn a somersault, swim, sit, and smile; in short, every performing verb in the dictionary. All actions involve muscles.

The ability to process symbolic information includes a series of subabilities: coding, storing, associating, integrating, retrieving, and expressing parts or patterns of the external environment.

Symbolic information is available in all the forms of objects in Sphere II, the external environment. Symbols are objects or patterns of objects which stand for other objects, events, or patterns of events. Energy as an attribute of all objects is an intrinsic part of Sphere II. There are naturally occurring signs such as the tracks of animals, the sounds of dropping water, and star patterns. There are deliberate signs made by human beings such as smoke patterns, pictographs, traffic lights, spoken words, gestures, handshakes, musical patterns, printed numerals, written documents, and whistling sounds.

Coding begins with the processing of sensation. Expressing ends with the controlling of body movement. Between coding and expressing are events not yet understood. These events take place in an internal environment not yet susceptible to explication, and certainly not ethically open to deliberate experimentation in human beings.

The six subabilities postulated for this document have been identified from the inferences of its writer from direct observation of persons engaged in processing symbolic information. These subabilities have also been identified

by researchers in human performance in learning and memory. It is noteworthy that the conceptualization offered here extends to creativity, which can be considered reorganizing reality, repatterning the environment, or focussing on a new and different part of the environment. The governance structure of education continually draws attention to pupil performance in two areas of symbolic information, language and mathematics. Processing visual symbols for auditory language is involved in both reading and arithmetic.

Sphere III, Other people. Two abilities have been identified: the ability to relate and the ability to communicate.

Sphere III, other people, is outside of Sphere I, the internal environment, but coexists with Sphere II, the external environment. The role of other people in the life of a pupil is so important that Sphere III is a necessarily separate sphere in this document. Other people are considered in the pupil's person-to-person relationships with them. These relationships are carried on in two modes: bodily presence and voice.

The ability to relate includes the functions of getting along with other individuals in the same proximity, meeting new people, and perceiving the feelings or the intentions of other individuals.

The ability to communicate includes the functions of receiving and sending messages.

Sphere IV, Society. Two abilities have been identified: the ability to survive and the ability to hold one's own as a peer.

Sphere IV, society, is outside of Sphere I, the internal environment, but coexists with Sphere II, the external environment and Sphere III, other people. Society is considered as the rules and patterns of organization are created or maintained by people acting together. Society includes historically natural units such as families and cultures. Society, for purposes of this document, includes regularly occurring units such as school classrooms, restaurants, business offices, bus passenger loads, civic committees, hospital wards, factories, and political governing bodies.

Just as Sphere IV is an abstraction or generalization of spheres I, II, III, so the abilities in Sphere IV are abstractions, referenced to the expectations of society for one's peers. Exhibiting patterns of abilities in spheres I, II, III, and IV appears to qualify a human being as possessing one or more abilities in Sphere IV. The ability to hold one's own as a peer presupposes the ability to survive. The exact conditions for survival

depend on the constellation of abilities possessed and the requirements of the particular facet of society involved. Suffice it to say that no human being has the ability to hold one's own as a peer in all possible facets of society under all possible forms of the external environment and with all other people.

Sphere V, Instruction. One ability has been identified: the ability to learn.

Sphere V, instruction, permeates the four other spheres. Instruction takes place in a variety of environments, with a variety of people, and in a variety of instructional modes. Although education's chief emphasis is on learning, educators recognize that they are not the only instructors of any pupil. Parents, family members, peers, people in the community, and the pupil assist in the learning process.

Learning is defined as a measurable, verifiable change in performance. Three subabilities have been identified for this document: preparation, acquisition, and use. Each subability can be considered a phase of learning. In each phase the pupil performs. The particular actions performed by the pupil are different according to the task being performed. However, certain elements of performance are the same in all tasks in the three phases of learning. For example, every task takes place in time and is composed of actions.

Section 2: Analysis

Two types of analysis have been identified: quantitative and contrastive. Both types of analysis apply to all ten abilities in all five spheres of performance. Each type of analysis will be discussed separately. Because the emphasis of education consumers is on Sphere V, Instruction, more attention will be given to analyses of performance elements in the three phases of learning.

Quantitative Analysis. The units of analysis for each ability and subability in spheres I, II, III, and IV depend on the particular task performed and the level of data collection. The level of data collection depends on the reason for pupil study, the discipline collecting the data, and the evidence required by the consumer. The types of data vary from blood chemistry information to speech production to entire life history.

Persons assessing pupil performance in spheres I, II, III, and IV are typically assessing the use of an ability. For example, in Sphere II, processing sensation, one of the subabilities is detecting sound. The person assessing the ability of a child to detect sounds presents a series of discrimination tasks to the child. Typically, the child indicates the

presence of sound by performing a particular action and indicates the absence of sound by not performing the particular action. The person assessing the child's ability is prepared to switch to an instructional mode in which the child learns to perform the task of indicating whether or not a sound is present. The indication task is a form of self-report.

Persons assessing performance in Sphere V are assessing elements of pupil performance in the three phases of learning: preparation, acquisition, and use. Examples of performance elements are the number of opportunities for responding, the amount of support required by the pupil from other people, the number and types of demonstrations required, the consistency of the actions performed, latency (the time period between the signal to act and the pupil's action), the energy required to perform the task, the appropriateness of the action, the language of any verbal directions.

Caution must be exercised at this point. Little information on these Sphere V elements of performance is generally available on any population or on any contrast referent. In addition, special problems exist, such as determining and measuring differences and specifying the evidence required for verifying both the measurements and the differences. It is clear that persons working in Sphere V must acquire measurement skills for dealing with variability and reporting skills for dealing with deviation. Variability is defined as differences within individual pupils. Deviation is defined as differences between pupils as a group. Use of performance elements as the units of data collection and analysis permits information to be reported to consumers, provided there has been agreement on the performance elements before the data collection begins.

Contrastive Analyses. A quantitative description of pupil performance elements in each sphere of performance is placed in a frame of reference by comparing the description with one or more other descriptions of performance. The other descriptions are chosen from four frames of reference, or contrast referents: typical persons or atypical persons, as groups or as individuals.

The pupil herself or himself is a special case of an individual contrast referent. The accumulation of performance element information is an individual accomplishment record.

Section 3: Synthesis

Items of pupil information from a variety of sources in the five spheres of performance, in a variety of units of measurement, are combined so as to make sense to consumers.

Persons in Sphere V look for information from persons in the other spheres on the elements of performance in Sphere V. Information from other spheres is helpful when it is presented on the three phases of learning; for example, the number of times a verbal direction was repeated before the pupil began to perform the discrimination task used to assess the ability to process sensation.

Considering the pupils' abilities in all spheres of performance prevents overpromising in prediction. Considering the performance elements as the target of instructional program assists program evaluators and managers in designing and carrying out appropriate evaluation plans.

Program impact is considered the aggregation of pupil change in performance elements related to movement in the three phases of learning in the spheres of performance. Performance element information can be aggregated or sampled along all the generally used demographic dimensions such as age, number of days of instruction, age of onset of condition, or type of instructional program. Performance element information can be used for study of relationships between school and nonschool situations. For example, latency: Is the pupil prompt for music class but late for work at the music store? The aim of education for deaf pupils may not be to make the deaf pupils hear. Rather, the aim of education for the deaf may be to assist the deaf pupils in learning to use any ability to process sound. One objective for a particular pupil might not be to increase the number of low-frequency sounds which can be consistently discriminated. Instead, the objective may be to increase the consistency with which the pupil communicates with hearing pupils in recreational situations.

Conclusion

The test of the Synthesis of Abilities Model is in the logic of its structure and in its utility to the persons in the governance structure of education. Using the Synthesis of Abilities Model, consumers of program evaluation can discuss the type of information they want and agree on the evidence they require.

School staff and allied professionals can use the Synthesis of Abilities Model as a stimulant for organizing their procedures for pupil study, documentation, and reporting. Program evaluators can use the model as an organizer of pupil data for clustering, aggregation, and analysis and reporting.

Among the primary users of the Synthesis of Abilities Model may well be the teachers and the parents. It is teachers who take the responsibility for changing pupil performance through instruction. It is parents who have the responsibility for their children and youth during their period of growth and development.

In the long run the chief beneficiaries will be the pupils themselves. It is the pupils who will profit most from accurate and systematic information about their own abilities, for "as we think about ourselves, so do we become."

CHAPTER V

Seminar Questions for Application of the Models

This chapter has been included in response to the recommendations of Project SEEM's Operational Audit Team. The purpose of Chapter V is to raise questions in order to stimulate and facilitate reflection and discussion of the ideas presented in the document. Blank pages have been provided for noting additional ideas which occur to readers and discussants.

The following questions have been derived from comments made by readers and reviewers of the document. The questions are intended to stimulate discussion, not to limit discussion. Individual readers and groups are encouraged to add their own questions, to revise those presented here, and to disagree with the ideas presented in the document. In preparing to respond to the questions, readers might consider the questions in two ways: first, in general; and second, in the particular program they have responsibility for.

The questions have been ordered according to the sequence of the document. The questions have been displayed on each page so that they can be duplicated on 3 x 5 inch cards for ease in arrangement.

Foreword

1. Would more adequate program evaluation and pupil information assist special education decision makers to improve programs?

2. Has the learner-centered emphasis long been recognized as a need in special education?

3. Has the learner-centered emphasis been utilized as an excuse for not initiating program evaluation designs?

4. Will a reader of this document find guidelines, procedures, and/or directives, as is typical of State Department of Education publications?

5. Other

Chapter I. Introduction to Program Evaluation in Special Education

1. Is program evaluation a necessary part of ongoing planning and programming for exceptional individuals?

2. Do special education personnel express a need for a document that would serve as a resource for developing evaluation designs?

3. What is the importance of the phrase "agreeing to" in the definition of program evaluation?

4. Is the current literature relating to evaluation of special education programs acceptable?

5. Should program evaluation be a program improvement device rather than a "proving" technique?

6. Is there a relationship and interdependence between planning and evaluation?

7. Do we have to define "program" before we can think about "program evaluation?"

8. Would involving evaluators in program planning help special educators avoid past mistakes and insufficient utilization of resources?

9. Do program evaluation requirements engender fearfulness and anxiety?

10. Other

Chapter II. The Consumer Model for Program Evaluation

1. Why should an education program leader ask consumers questions about programs and program effects?

2. Which elements in the governance structure have accepted the responsibility for program evaluation?

3. Is the pupil really the point of interaction of the consumers as depicted in the Consumer Model for Program Evaluation?

4. Do the actions of the Superintendent of Public Instruction directly or indirectly affect the pupil?

5. Why are the courts placed next to the parents?

6. Figure 1 omits mention of a national board of education. Why?

7. What is the role of higher education in the Consumer Model for Program Evaluation?

8. Have the essential features of the consumer model been identified?

9. Does the pyramid building block structure appropriately describe the processes necessary to assign responsibility, provide resources, train people, and so on?

10. Would it be more helpful to present a flow chart with appropriate feedback channels?

Chapter III. Pupil Information in Special Education

1. Is it good to be reminded that schools exist to enhance the performance of pupils?

2. Are variability and deviation in pupils the two most significant problems in the evaluation of special education programs?

3. How helpful to teachers and parents are current measures of pupil performance?

4. What useful structures for organizing pupil information are in existence now?

Chapter IV. Synthesis of Abilities Model for Pupil Information

1. Is the vocabulary of the Synthesis of Abilities Model easily understood by all readers?

2. What does "transmute" mean?

3. Are the interrelationships among the elements identified in the Synthesis of Abilities Model easily understood?

4. What is this "internal environment" in Sphere I?

5. Are the ten abilities stated in the simplest terms? (Easiest to understand, and still convey the intended meaning?)

6. What are the relationships between and among the spheres of performance?

7. Are the spheres of performance mutually exclusive?

8. Does learning permeate all the spheres?

9. What are examples of the preparation, acquisition, and use phases of learning?

10. Are the spheres of performance hierarchical?

11. Do special educators pay so much attention to how the pupil learns that they don't attend to what they're asking the pupil to learn?

12. Where in the Synthesis of Abilities Model does data become information?

13. Would using this model for pupil information lessen the amount of conclusion jumping?

14. Is the Synthesis of Abilities Model for Pupil Information an approach to evaluation design focussing on the learner?

15. Other

Chapter V. Seminar Questions for Application of the Models

1. Is the document a philosophical statement of evaluation as it relates to special education?

2. Is there general support for the document as a philosophical statement of evaluation as it relates to special education?

3. Does the document provide a theoretical framework that will stimulate the development of operational evaluation designs?

4. Is there general consensus and enthusiasm for the concept of a consumer model for program evaluation with the focus on the learner?

5. What does all this mean to me as a _____? (Fill in your own choice of self-descriptors.)

6. Should both models, the "Consumer Model for Program Evaluation" and the "Synthesis of Abilities Model for Pupil Information," be considered in the design of comprehensive evaluation systems?

7. Do these models apply to all education programs and all pupils?

8. Should ongoing development of the models be carried on?

9. Would essential activities to carry on ongoing development of the models include....

   - opportunities for field review?
   - revision?
   - development of operational manuals/ handbooks and/or guidelines?
   - testing?
   - pilot implementation?

10. Would a pilot endeavor to apply the theoretical model to programs in operation be helpful in identifying the process and procedures necessary to operationalize the model?

11. Should the cost of implementing the evaluation models at the operating level be considered as a major component of any field test design?

12. Can discussing these models help a school staff create their own adaptation, tailored to fit their pupils, programs, and consumers?

13. What would be the effect of incorporating specific concrete examples into the document?

14. What additional costs would be incurred as a result of adopting these models?

15. Are there costs presently incurred which would not be necessary if these models were adopted?

16. What would be the effect of bringing together small groups of persons to discuss and critique the document?

17. Is the seminar approach an appropriate way to become familiar with the content and intent of the document?

18. Is there a role for institutions of higher education in these models?

ABSTRACT

This document presents two new models for educational evaluation with emphasis on special education: the Consumer Model for Program Evaluation and the Synthesis of Abilities Model for Pupil Information.

The Consumer Model for Program Evaluation covers the governance structure of education and emphasizes the pupil as the focal point. The chief features of the Consumer Model are responsibility, budget, trained people, reporting, use of information, design, measures, and basis for evaluation.

The Synthesis of Abilities Model for Pupil Information is applicable to all pupils in all learning situations. The chief features of the Synthesis of Abilities Model are abilities, spheres of response, analyses, and synthesis. Ten abilities are identified in five spheres of performance. Quantitative and contrastive analyses are discussed. Emphasis is placed on pupil performance elements in three phases of learning: preparation, acquisition, and use. Learning is defined as a measurable, verifiable change in performance.

Program evaluators and managers at all levels of the governance structure of education are encouraged to work with consumers to clarify their information needs, specify the evidence required, and provide the resources necessary to supply accurate, timely, and helpful information.

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