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9. ABSTRACT

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Volume 1 of a six-volume set of seminar guidebooks is intended for use as a teaching aid in seminars designed to inform officials and educators about educational outcome measurements so that government planners in developing countries can assess how well their educational systems are functioning. It focuses discussion on types of outcome measurements. Questions covered include: the kinds of individual and social competencies or outcomes being sought through education, the specific measures of educational outcome which may be used to measure the primary effects of education on the individual's learning, knowledge, aptitude, and skills, and how outcome measurements differ from traditional input or process indicators that have guided educational policies in the past. Also examines what is sacrificed to devote more resources to education and to allocate more resources to one educational program rather than another, and what the yardsticks are for assessing criteria to measure outcomes. Notes relating to those and other questions are presented for the discussion leader, along with tables of educational outcomes and schematics of decision processes.

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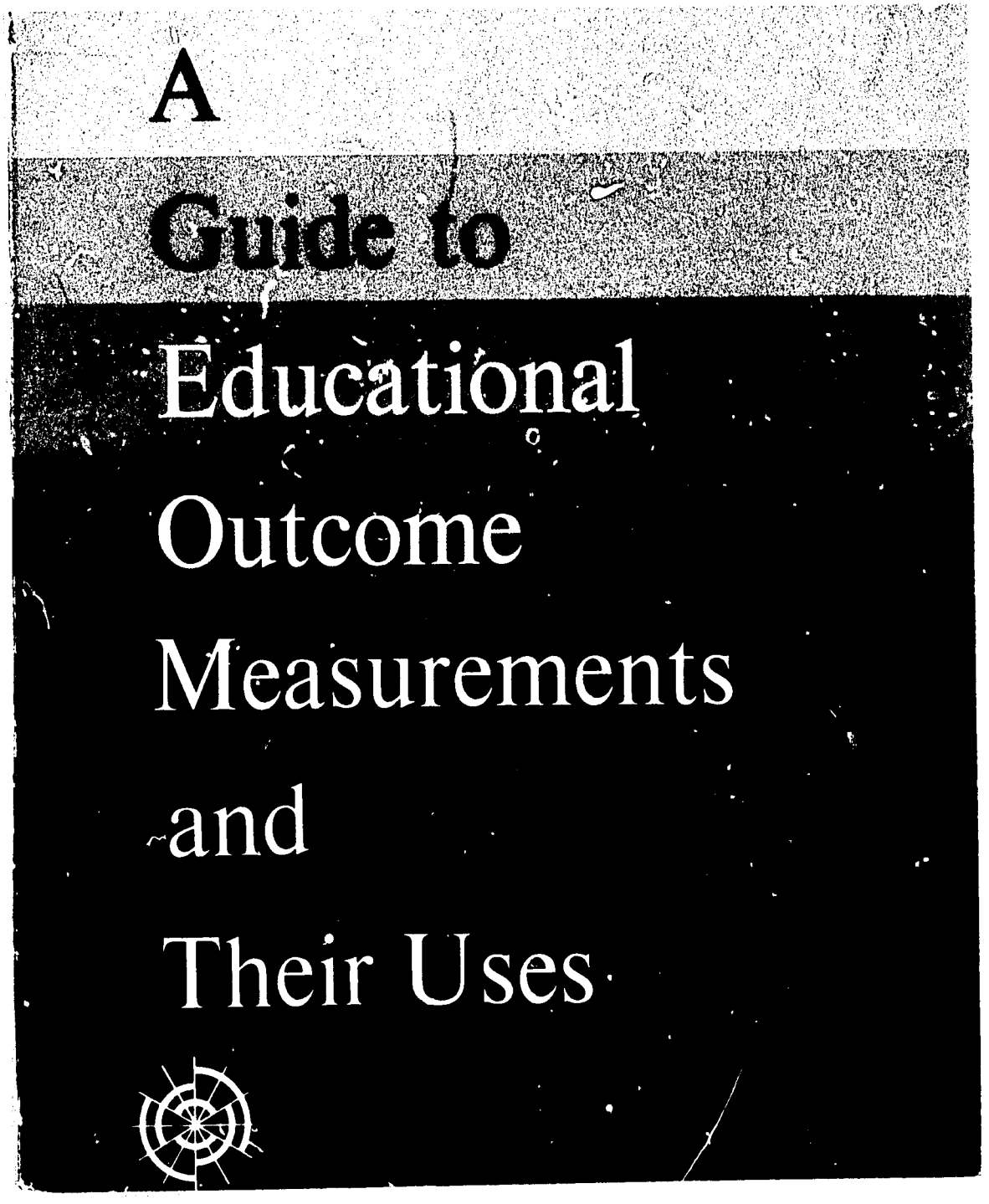
SEMINAR NO. 1

TYPES OF OUTCOME MEASUREMENTS



A GUIDE TO

EDUCATIONAL OUTCOME MEASUREMENTS AND THEIR USE

SEMINAR NO. I
Types of Outcome Measurements

SEMINAR NO. II
Uses of Outcome Measurement

SEMINAR NO. III
Generating Outcome Measurements: Achievement and Attitudes

SEMINAR NO. IV
Generating Outcome Measurements: Economic and Societal

SEMINAR NO. V
Applying Outcome Measurements

SEMINAR NO. VI
Feedback Consequences and Steps toward Implementation

SEMINAR NO. I

TYPES OF OUTCOME MEASUREMENTS

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PREFACE

This guide essentially is designed as a teaching aid for those who would inform planners, officials of educational ministries, school administrators, principals and teachers about educational outcome measurements.

In recent years, educational services and facilities have made increasing claims on national economic systems. Since the needs of all public services, including education, are pressing and sum to totals far in excess of resources available, it has become urgent that governments initiate processes of questioning both existing resource uses and those proposed, asking: Can we serve the public better and more cheaply? What can we do that would more surely achieve the results we seek?

Responsible education, planning, and finance officials have indicated great interest in measurement of educational results as a beginning step to finding answers to these questions.

In outline and graphic form, this guide presents topics for discussion in seminars dealing with the following subjects:

I. Types of outcome measurements
II. Uses of outcome measurement
III. Generating outcome measurements (achievements and attitudes)
IV. Generating outcome measurements (economic and societal)
V. Applying outcome measurements
VI. Feedback consequences and steps toward implementation.

The outlines for six seminars which follow are intended as guides or preliminary "lesson plans." The discussion leader will select material appropriate for his group. His additions of information and illustra-

tive materials that are of particular importance to his country's (or region's) educational system would greatly enhance the discussion.

"Figures" are presented before each discussion question and are tended to serve as visual aids. The discussion leader may distribute copies to group members or he may find it helpful to enlarge the figures into charts to use for the discussion, or to have view graphs made for this purpose. To facilitate such use all figures are reproduced in appendix B.

The topics covered can be so selected that a general orientation about educational outcomes may be presented in summary form in a single seminar, or more in depth discussion would require at least 6 seminars. Extensive training of one year or more is required to develop skills needed to properly design measurement instruments or the analytical capacity to apply them. However, for those who have the required analytical and quantitative skills already, participation in the seminars outlined would help provide an understanding of the policy implications of the emphasis on outcomes. The seminars are not designed as technical training, rather they are intended to:

- Provide an understanding of the different types of educational outcomes.
- Identify the variety of uses of outcome measurements.
- Help convey the choices on outcome measurement instruments and yardsticks for policy officials, school administrators and teachers.
- Provide some rudimentary understanding of the tools of analyzing the correlates of education outcomes.
- Make plain the possible impact of emphasis on educational outcomes for educational planning and school finance, as well as work in the classroom.

To use the seminar format the following steps are required:

STEP 1
A seminar discussion leader must be selected.

STEP 2
The discussion leader, together with the educational officials sponsoring these sessions should identify the particular purposes of the seminar, and should answer such questions as: For whom are the seminars intended? What is the purpose of carrying out the seminar?

STEP 3
Seminars should be announced as an offering with (a) the clear indication of top level support, and (b) a practical use of the learning

achieved in the continued work of the official, administrator, or teacher.

STEP 4

The discussion leader might select from the materials and "figures" presented in this guide those that appear particularly useful for the specific groups with whom the discussions are scheduled.

As an aid in this selection process, Appendix A suggests some portions of the text that appear most important for the following groups:

- top officials concerned with overall policy planning
- middle management in Ministries of Education and Finance
- school administrators
- school principals
- teachers
- instructors in teacher training institutions.

STEP 5

Supplementary reading materials should be selected. Supplementary readings are available from the Public Services Laboratory of Georgetown University; these include **Educational Outcome Measurement in Developing Countries: An Annotated Bibliography;** and **Educational Outcome Measurement in Developing Countries.**

STEP 6

Some preliminary evaluation should be introduced at the close of the seminars to determine whether the objectives of each seminar have been fulfilled. This can be done by testing instruments, by questionnaire, or by final closing comments of participants.

Such evaluations tell us little about whether the seminars made a difference. Only practical application indicate whether the seminars were successful in changing traditional practices.

TOPIC TO BE COVERED:
TYPES OF EDUCATIONAL OUTCOMES

Objectives of Seminar No. I

At the end of the seminar those participating should:

(1) Understand that educational outcomes sought are a function of the purposes of the school, educational system and national educational policies.
(2) Understand that educational outcomes are multidimensional having short-range, intermediate and intergenerational effects, and be able to identify such different outcomes.
(3) Be able to compare the hypothetical structure of outcome measurements with measures now in use in his school, region, or country.
(4) Understand how outcomes fit into the overall educational planning system.

Introductory Question for Discussion

What kinds of individual and social competencies or outcomes are being sought through education?

NOTES FOR DISCUSSION LEADER

The discussion leader might begin with the question stated above to encourage an exchange among participants on what the educational system is intended to do.

The ensuing discussion will necessarily vary depending upon the responsibilities of the participants in the school system. For classroom teachers "competency" takes on a far greater specificity than it does for the planner, for example. And often the teacher has far less latitude in determining curriculum content, or even for upper divisions entrance eligibility.

While the types of outcomes presented during the course of the seminar tend to be general measures, it is important for the discussion leader to emphasize that outcome measurements as applied (the several applications are to be discussed at a subsequent seminar) require "counts" or quantifiable outcomes. At one extreme are the quantifiable outcomes that need to be identified for computerized instruction. To program such instruction, decisions have to be made about the program of study in each class. To cite just one example, it becomes necessary to know just how many three-letter words the primary grader should learn to spell. At the other extreme is outcome in the form of higher output and earning in a specified development project or for a region.

The emphasis is suggested because for many decades if not centuries there have been vigorous debates about goals of education. While is is helpful to use these familiar debates as a "springboard," it is essential to redefine those goals, objectives or purposes in a framework that leads to quantification.

Many among the participants will object to quantification suggesting that some outcomes are qualitative. This may be so, and observations about qualitative outcomes may become necessary because research scholars have not yet reached out to find more precise ways of measurement of so-called intangibles.

Ideas for Presentation

The results of education are perhaps best described as multidimensional educational products. For this seminar, we mean by education outcomes those results of learning which affect (1) the advancement and development of the individual, (2) the quality of living of the individual in the social community in which he functions, and (3) the development of the society in which the individual lives, that is, its economic, social, and political system. Each of the aspects in turn are made up of many facets (see Figure I-1).

FIGURE I-1

EDUCATIONAL OUTCOMES ARE MULTIDIMENSIONAL AND SEQUENTIAL

*Personal Development**	*Quality of Life*	*Societal Development*
PRIMARY EFFECTS in the course of education		
• Achievement	• Personal hygiene	• Primary work skills
• Aptitude	• Recreational habits	
• Attitude		
• Attribute		
SECONDARY EFFECTS on completion of education		
• Personal attributes	• Skills in using health facilities	• Increased productivity
• Personal attitudes		• Economic growth (employment and income)
• Motivation for progress	• Rural living skills	
• Distaste for manual labor	• Skills in using foodstuffs	• Mobility (social and economic)
	• Utilization of housing facilities	• Targeted income improvement
TERTIARY EFFECTS intergenerational		
• Personal characteristics of children	• Quality of life of children	• Societal advance of children
		• Migration patterns

* Intellectual and emotional development

EDUCATIONAL OUTCOMES ARE MULTIDIMENSIONAL AND SEQUENTIAL

Question for Discussion

What specific measures of educational outcome may be used to measure the primary effects of education on the individual's learning, his knowledge, aptitude and skills? How do these relate to secondary effects and tertiary or intergenerational effects?

NOTES FOR DISCUSSION LEADER

When this overall framework of outcome measures is presented, it is perhaps useful to explain, first, that different types of outcome are useful for assessing learning at primary, intermediate and secondary grade level and formal and nonformal education. For nonformal education, for example, skills, knowledge, and attitudes of both primary and secondary types are especially important to review as are the indicators of societal development. Selections have to be made among the outcomes and then measurements have to be found that can help identify existing levels of skills, knowledge, attitudes, etc. The outcomes shown in Figure I-1 are illustrative; they are not intended to be comprehensive.

Much interest is likely to center on primary education's outcomes. Here, outcome requires selection for each grade level of the "bits" of knowledge, the skills, attitudes that are being sought. The "bits" of knowledge and skills require specific definition if they are subsequently to be tested and findings are to be applied. Similarly, it is useful for a school system to understand about aptitude levels; some school systems may want to ferret out talented individuals and develop those talents as a method of achieving greater social and economic equity. Attitudes and attributes are of many kinds. Hundreds of concepts of measures have been developed by psychologists and sociologists. And for each concept there are frequently many, many survey instruments, sometimes numbering in the hundreds.

Ideas on Presentation

Personal outcomes for much of primary education is of four types: developing the child's attributes, attitudes, aptitudes, and subject matter achievements. [See Figure I-1 for some positive and negative outcomes of education.] Together the proxies chosen for these four educational products permit an assessment of education to ascertain whether educational outlays are ferreting out talent and yielding the intellectual and emotional development for its young that a nation intends to gain.

Education also influences **quality of life.** For example, education is a way of improving health: teaching the use of limited foodstuffs for maximum nutritional value, the value of vaccinations and immuniza-

tions, and the role of personal hygiene in prolonging life, planning childbirths, and averting baby deaths.

Education is also a way of advancing the **development of society,** by raising productivity, giving individuals access to economic and social progress, and developing skills for living and working in rural communties. Through education, knowledge and skills in society are advanced and the competence is developed to apply technology produced elsewhere.

The multidimensional educational product captures in a continuum those aspects that encompass the life of the child and then the adult. Education may be viewed as a long-term investment—an investment to be tested in terms of rate of return through employment, occupational opportunities, and earnings. Thus, education affects economic growth, productivity, and income levels for those in the poorest economic circumstances, and has secondary impacts on the culture.

Education affects the life of the individual and the social and economic milieu in which he lives, both immediately and in the long run, and it has important intergenerational impacts that cannot be neglected. Families have much to do with learning and attitudes toward learning. The education of the father and the mother is an important determinant of the educational achievements of their children.

FIGURE I-2A

TRADITIONAL MEASURES OF EDUCATION

Traditional measures by which resources for education have been judged in the past include:

- size of class
- drop out rates (wastage rates)
- teacher qualifications
- years of compulsory schooling provided
- enrollment rates
- average years of schooling of the adult population
- textbooks available: laboratory equipment
- school buildings' standards

TRADITIONAL MEASURES OF EDUCATION

Question for Discussion

How do outcome measurements differ from traditional input or process indicators that have guided educational policies in the past?

NOTES FOR DISCUSSION LEADER

It may prove useful to develop the discussion by formulating as a sub-question for consideration the following: What indicators now identify need for education change, e.g., more financial resources, curriculum modification, more teacher training?

Perhaps a list of those indicators on a blackboard or easel would help to identify what is now being used. These indicators can then be compared with the outcome measures shown in Figure I-1.

Note that the percent of school age population enrolled for urban areas exceeds the total school age population. This peculiarity could occur because: (a) those enrolled are not children of school age, (b) children counted in the rural population go to school in urban areas, (c) the data reported are not accurate as to either the count of children, or the count of enrollment.

Ideas on Presentation

Traditionally, educational policy has been assessed not in terms of outputs but in terms of inputs or processes.

For many years, the indicators of "need" for educational resources have been input measures, as if the more resources used or the higher the expenditures, the greater the educational achievement. Educational targets defined in terms of "the more the better" are slowly giving way with the recognition that resources are limited, and that "more" inputs do not necessarily result in "better" learning. The more resources spent for one purpose, the less available for others.

Educational outlays in the past have been assessed in such terms as (a) relative size of the expenditures per student, (b) the numbers of students per classroom or per teacher, or (c) the educational qualifications of teachers (see Figure I-2A). Recently, however, emphasis has shifted to a closer analysis of educational policies and the processes that produce results for students.

Traditional measurements have sometimes been presented as aggregates or as averages (see Figure I-2B). But the distribution of input quantities also are important to understanding education and its variation from school to school, class to class. The variations may include:

(1) degree of segregation of groups in school;
(2) inequality of inputs (books, teaching aids, size of class, facilities);

FIGURE I-2B

SOME EXAMPLES OF TRADITIONAL INPUT-ORIENTED ASSESSMENT MEASURES IN USE

San Salvadore, 1970

Measure	*Data*
Illiteracy among 10 year olds	
Number of students enrolled	628,000
% of students enrolled	87
Primary school enrollment	
Urban	221,000
Rural	388,000
% School age population enrolled	
Urban	(148)
Rural	(92)

School Enrollment Rates in 1967/1968

Region	*Children of primary-school age attending school (at any level)*	*Children of secondary-school age attending school (at any level)*	*Students registered for higher education in relation to young people aged 20-24*
North America	98	92	44
Europe and U.S.S.R.	97	65	16
Oceania	95	60	15
Latin America	75	35	5
Asia	55	30	4
Arab States	(50)	(25)	
Africa	40	15	1

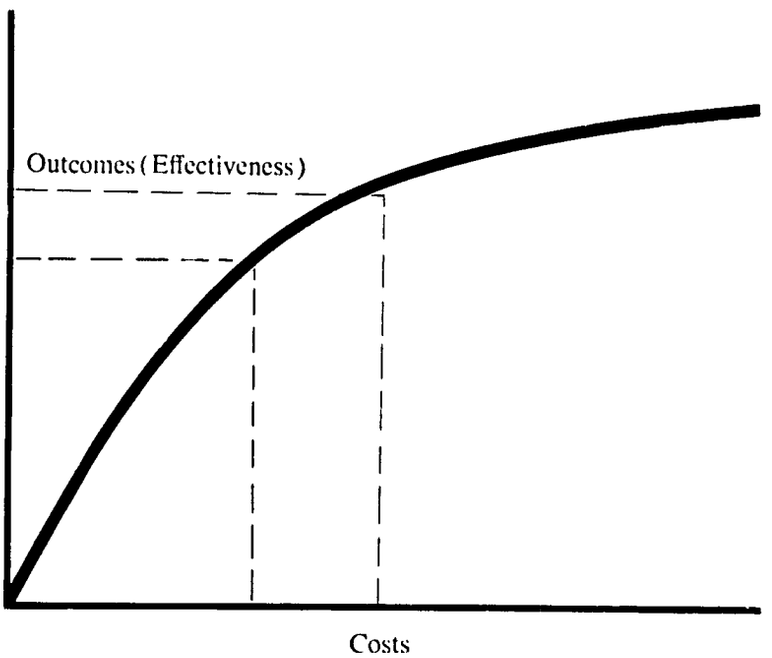
(3) differences in attitudes of teachers to the several groups in the population; and
(4) inequality of intangible resources such as attitudes towards educational levels, e.g., trades.

Some of the traditional measures are clearly input measures, that is, the resources devoted to education such as teachers, textbooks, school buildings. Others are attempts at moving away from inputs to process level criteria such as size of class or years of compulsory schooling. Still others are first efforts at measuring output in quantity terms such as enrollment rates, drop outs. But few traditional measures dealt with output (see Figure I-2B).

FIGURE I-3

ADDED RETURNS NOT PROPORTIONATE TO ADDED COSTS

The Basic Economic Model



ADDED RETURNS NOT PROPORTIONATE TO ADDED COSTS

Question for Discussion

Are additional returns from increased education expenditures equivalent to that increase in expenditures?

NOTES FOR DISCUSSION LEADER

The figure shown displays a rudimentary concept of economics, namely, that diminishing returns set in and that those returns fall as additional resources are devoted to the production of educational services.

It might be useful to divide the chart into equivalent segments so that amounts can be shown as dotted lines. The group's attention should be called to the lower returns for each successive equivalent sum spent.

And it might be pointed out that unless outcomes are measured there is no way of assessing the costs in relation to changes in outcomes.

Ideas on Presentation

Educators in the past have urged more expenditures for education as if higher expenditures produced increased learning. The more the better was the rule.

The basic model of cost effectiveness (see Figure I-3), however, drawn from most elemental economics shows this is not so. In that basic model, the notion is that added returns or the marginal returns decrease and after a time are exceeded by added cost.

This concept of incremental returns that diminish after some point of increasing inputs is reached has important implication for educational expenditures:

(1) It suggests that the amount of additional expenditures will not necessarily produce increased learning or improved attitudes of the children or adults who are being served by the educational system.
(2) It points to inquiry about the impact on outcomes of increasing or decreasing expenditures by some specified amount or percentage.

FIGURE I-4A

RECOGNIZING OPPORTUNITY COSTS OF EDUCATIONAL EXPENDITURES IN PLACE OF "THE MORE THE BETTER"

Identify the cost of more educational services. What do these educational services mean by way of sacrificing other uses of the same resources?

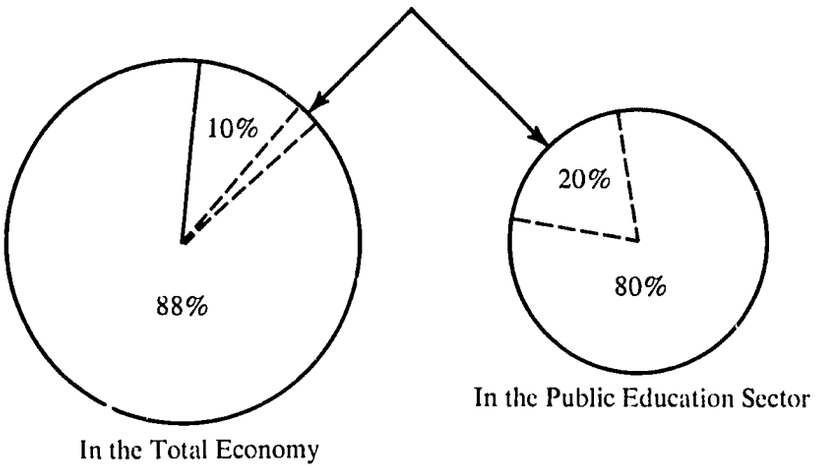
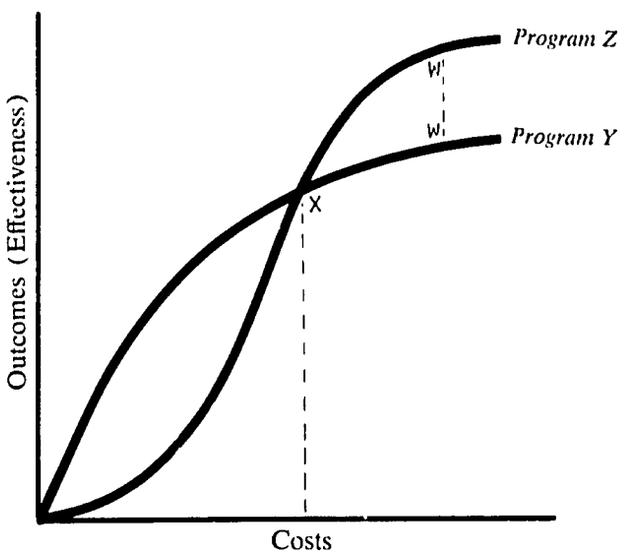


FIGURE I-4B

COST-EFFECTIVENESS COMPARISONS



RECOGNIZING OPPORTUNITY COSTS OF EDUCATIONAL EXPENDITURES IN PLACE OF "THE MORE THE BETTER"

Question for Discussion

What is sacrificed to devote (a) more resources to education, (b) more resources to one educational program rather than another.

NOTES FOR DISCUSSION LEADER

Call attention to the size of the public education sector relative to the total economy in Figure I-4A. The diagram is drawn only to suggest that one share of the education sector equivalent in size to a share of the total economy may deflect resources from other opportunities.

Note that the educational sector according to U.N. figures claims 6-8 percent of GNP in many developing countries.

Figure I-4B illustrates the principle of choice among educational programs. Along the horizontal line are costs of the educational activities or programs. Up to the point X, the effectiveness of program Y is greater than the effectiveness of program Z; beyond that point there is little change in effectiveness of program Y, even if expenditures were increased.

Ideas on Presentation

The concept that a nation has insufficient resources to fund all proposed educational programs is a simple one. It becomes necessary to choose among the programs and for these choices management must have the means to correctly estimate costs of optional programs and the potential gains from each. There are many choices to be made in terms of levels of schooling and about proportion of persons in each age group to be provided with opportunities for education; there are also decisions about methods of production of education at different educational levels.

There is no grand scheme that tells us when spending for education will yield a higher (or lower) return than spending on health care, or on water supplies, or on hydroelectric power.

For some types of education, it is possible to compute an investment return and the value of education as an asset; these investment returns can be compared to yields on alternative investments.

When we have to choose public policies among a wide range of possibilities, we are compelled to select some things and give up others. The fact of choice is not unfamiliar; we are always in our daily private lives making choices because the funds we have to spend are limited.

We ask accordingly what outcomes do we want from education? Which of those outcomes do we want most?

FIGURE I-5

TYPES OF OUTCOME MEASURES

Measures of Economic Development

Measures of Work Skill

Measures of Cognitive Skills

Measures of Societal and Political Outcomes

Measures of Advance in Opportunities for the Rural Population and other Target Groups

Measures of Family, Village and Urban Levels of Knowledge, Skills, and Attitudes

Questions to be asked:

(1) What are the specific measures?

(2) What are theexisting data sources for these measures?

(3) How can a new data base be constructed?

Criteria for Selection of Outcome Measures

(1) Captures a defined purpose.

(2) Is comprehensive for multiple purposes.

(3) Distinguishes an output from others.

(4) Can be counted accurately.

(5) Provides a tested, valid count.

(6) Captures full costs.

(7) Is a validated proxy.

YARDSTICKS FOR ASSESSING CRITERIA TO MEASURE OUTCOMES

Question for Discussion

What are the yardsticks for assessing criteria to measure outcomes?

NOTES FOR DISCUSSION LEADER

In this part of the discussion the group might consider, on a tentative basis, the set of questions that are enumerated. Later in another seminar these questions will be probed at greater length.

It might prove useful to explore in the discussion the possible consequences of use of too partial an outcome measure asking (to illustrate) "if we knew about this" factor, for example, if we knew how well children could read at lowest levels—if we had the required data, would we have sufficiently comprehensive information about the outcomes from educational expenditures in the primary grades? What additional information is required?

Seven criteria to be applied in selecting outcome measures are enumerated. The criteria that are especially relevant vary with the type of program and plan. In general what is being sought is a measure or measures that can record accurately whether satisfactory progress is being made toward achieving the objective sought at the price "tag" that has been defined.

Ideas on Presentation

In Figure I-5 we present a listing of outcomes. For each of those types of outcomes, it is important to determine the measurements that would best capture the purpose and be most comprehensive in its coverage of that intent, so that by omission some aspect of outcome that is sought is not neglected unintentionally.

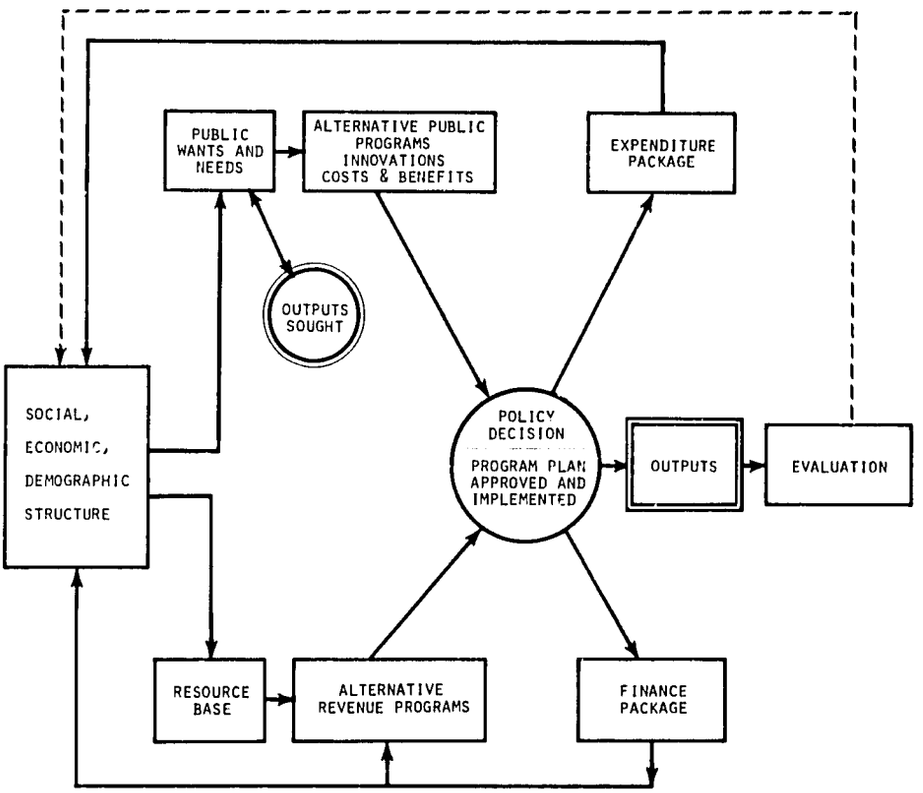
The listing is general; the criteria applied, however, must be operational, that is, identify in quantities (or specified quality terms) the kind of education, for whom, and with what specific purpose. If the objective is an advance in opportunities for the poor, it is necessary to specify what is meant by "poor" in terms of income levels, family size etc., and also to specify what an "advance" and "opportunities" mean. Is advance to be measured by some percentage improvement over the period before, or is it to be measured, for example, in comparative terms, that is, compared to others in the population. Are opportunities to mean specified types of employments, earnings, or opportunities to learn more about some specific subject matter?

At the outset, criteria are likely to be deficient. The deficiencies should not be surprising. New data gathering often will be needed and will follow after there is a clear recognition that the existing information is at best partial.

To achieve an understanding of education in terms of results sought, we must ask such questions as those set forth in Figure I-5. What, for example, are the specific measures that would tell us if we have moved more surely toward opportunity for education for those in rural areas?

FIGURE I-6

A SCHEMATIC PRESENTATION OF ACTIVITIES IN DECIDING ON EDUCATIONAL POLICY



EDUCATIONAL OUTCOMES AND POLICY DECISIONS

Question for Discussion

At what points in the decision process on educational policy is it useful to formulate, review, and assess educational outcomes?

NOTES FOR DISCUSSION LEADER

It is perhaps useful to examine the chart with the seminar group and discuss the various steps that are outlined for a systematic approach to educational policy formulation. In such a process, steps would be taken to assess needs, taking into account the social, economic, and demographic composition of the population, and formulate objectives. On the basis of such formulation of needs, step by step alternative methods for meeting them would be analyzed. These analyses of alternatives would produce some tentative policy decisions, for example, to spend more for primary education or to devote more resources to nonformal education.

It might be useful, too, to underscore that there is still an additional series of policy defining steps impacting on education decisions. The series of steps start from the capacity to raise revenues and the demographic, socio-economic factors that underlie that revenue capacity and step by step determine the amounts of revenue that can be raised (with tax increases and without). That amount then becomes the constraint on the tentative initial decision on program and on the budget and financing required.

Both the financial packages put together and the educational expenditure package impact on the social and economic conditions either supporting economic growth and greater equity or generating circumstances unfavorable for such change.

The resulting outcomes of the policies require evaluation so that if need be the policies may be altered to increase the quantity and quality of learning that is sought for those for whom it is intended.

The processes spelled out are not uniform from one contry to another. A discussion on the major components of the system would help to redefine the stages of the process as practised in a particular country.

Ideas on Presentation

Paths to decision vary from nation to nation. Figure I-6 portrays only one of a number of possible flows of activities involved in decisions about educational policy.

It is designed to underscore (a) that outcomes sought enter into that flow, and (b) that expenditure analysis and revenue analysis are inexorably linked.

There are many parts to the system that produces educational services that employs teachers, principals, administrators; that formulates curriculum, texts, teaching materials, and school building; and

that delivers educational services. The bringing together of those parts to produce the outcomes intended in an economical way is most complex. Much has to be learned about how to produce and deliver the competencies that are sought by the nation and its citizens.

The processes vary, too, depending upon whether the nonformal educational or the formal educational system is under consideration. In most countries there is a good deal of structure and tradition about formal education. However, it is the outcomes of the systems that can provide the necessary linkage and yield the flexibility that is required to facilitate movement of individuals between the two systems.

APPENDIX A

Selected Uses

As indicated in the Preface, some of the materials and "figures" in the six seminars may be particularly useful for the specific groups with whom the discussions are scheduled.

To some extent, selections will be made at the discretion of the discussion leader and may depend in part on the length of time available and on the amount of material included in the seminar.

Brief Comment on Selections from Seminars for Different Groups

Generally, Seminars III and VI, along with introductory material from Seminar I, are the most important for teachers, officials directly concerned with school administration, and teacher training institute instructors.

Seminars II, IV, and VI are most important in providing basic materials for top officials concerned with overall policy planning, middle management officials in Ministries of Education and Finance, and training institute instructors who teach planners and school administrators. Seminar I provides a backdrop discussion of concepts and of the multiplicity of outcome measurements. By and large, Seminar V will help inform top officials in planning and in Ministries of Education and Finance of what they can expect from the analyses.

Selected Uses for Seminar I

All materials in Seminar I will provide information on resource allocation for policy planners, officials of Ministries of Education and Finance and for those instructors in teacher institutions who are training educational planners and school administrators.

The following limited discussion topics would help to define the basic issue of resource allocation for school administrators, principals and teachers (as well as instructors for those groups in training institutions):

pp. 3-4	Educational Outcomes Are Multidimensional and Sequential
pp. 11-13	Added Returns not Proportionate to Added Costs
pp. 14 & 16-17	Recognizing Opportunity Costs of Educational Expenditures in Place of "The More the Better" (especially Figure I-4a).

APPENDIX B

FIGURE I-1

EDUCATIONAL OUTCOMES ARE MULTIDIMENSIONAL AND SEQUENTIAL

*Personal Development**	*Quality of Life*	*Societal Development*
PRIMARY EFFECTS in the course of education		
• Achievement	• Personal hygiene	• Primary work skills
• Aptitude	• Recreational habits	
• Attitude		
• Attribute		
SECONDARY EFFECTS on completion of education		
• Personal attributes	• Skills in using health facilities	• Increased productivity
• Personal attitudes		• Economic growth (employment and income)
• Motivation for progress	• Rural living skills	
• Distaste for manual labor	• Skills in using foodstuffs	• Mobility (social and economic)
	• Utilization of housing facilities	• Targeted income improvement
TERTIARY EFFECTS intergenerational		
• Personal characteristics of children	• Quality of life of children	• Societal advance of children
		• Migration patterns

* Intellectual and emotional development

FIGURE I-2A

TRADITIONAL MEASURES OF EDUCATION

Traditional measures by which resources for education have been judged in the past include:

- size of class
- drop out rates (wastage rates)
- teacher qualifications
- years of compulsory schooling provided
- enrollment rates
- average years of schooling of the adult population
- textbooks available; laboratory equipment
- school buildings' standards

FIGURE I-2B

SOME EXAMPLES OF TRADITIONAL INPUT-ORIENTED ASSESSMENT MEASURES IN USE

San Salvadore, 1970

Measure	*Data*
Illiteracy among 10 year olds	
Number of students enrolled	628,000
% of students enrolled	87
Primary school enrollment	
Urban	221,000
Rural	388,000
% School age population enrolled	
Urban	(148)
Rural	(92)

School Enrollment Rates in 1967/1968

Region	*Children of primary-school age attending school (at any level)*	*Children of secondary-school age attending school (at any level)*	*Students registered for higher education in relation to young people aged 20-24*
North America	98	92	44
Europe and U.S.S.R.	97	65	16
Oceania	95	60	15
Latin America	75	35	5
Asia	55	30	4
Arab States	(50)	(25)	
Africa	40	15	1

FIGURE I-3

ADDED RETURNS NOT PROPORTIONATE TO ADDED COSTS

The Basic Economic Model

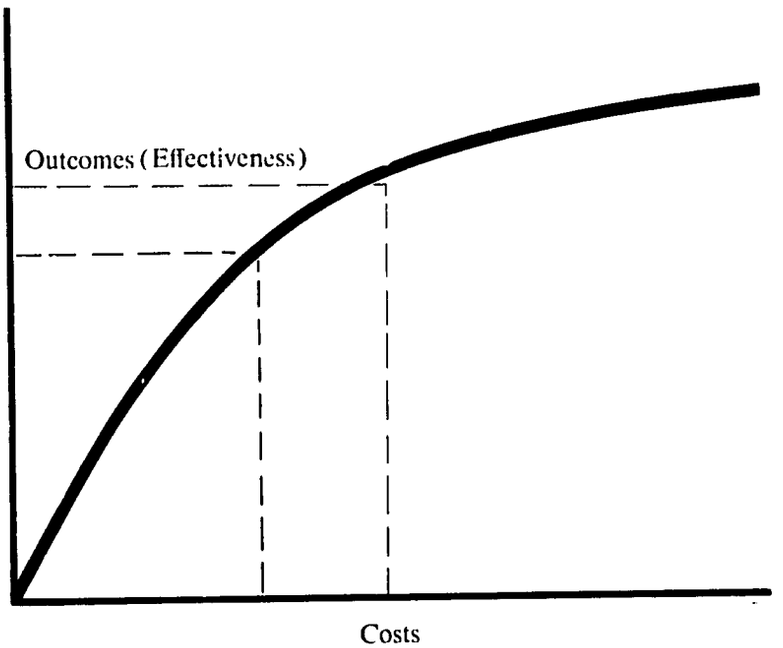
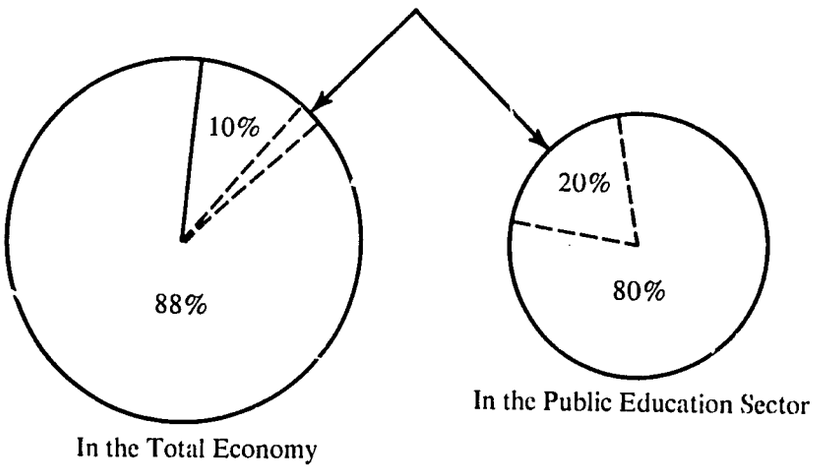


FIGURE I-4A

RECOGNIZING OPPORTUNITY COSTS OF EDUCATIONAL EXPENDITURES IN PLACE OF "THE MORE THE BETTER"

Identify the cost of more educational services. What do these educational services mean by way of sacrificing other uses of the same resources?



In the Total Economy

In the Public Education Sector

FIGURE I-4B

COST-EFFECTIVENESS COMPARISONS

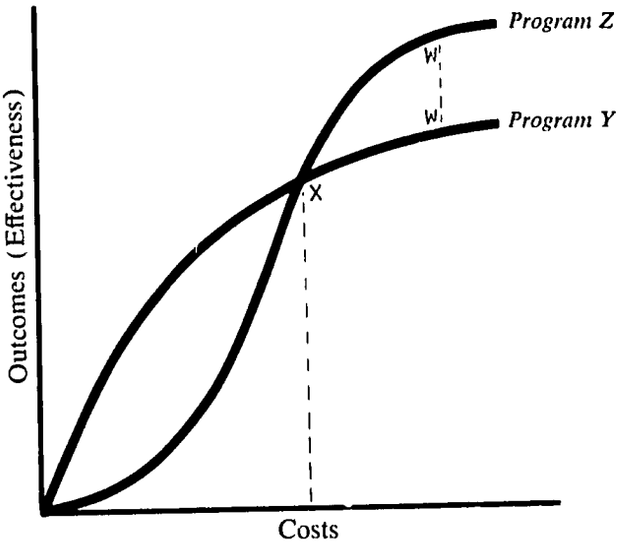


FIGURE I-5

TYPES OF OUTCOME MEASURES

Measures of Economic Development

Measures of Work Skill

Measures of Cognitive Skills

Measures of Societal and Political Outcomes

Measures of Advance in Opportunities for the Rural Population and other Target Groups

Measures of Family, Village and Urban Levels of Knowledge, Skills, and Attitudes

Questions to be asked:

(1) What are the specific measures?

(2) What are theexisting data sources for these measures?

(3) How can a new data base be constructed?

Criteria for Selection of Outcome Measures

(1) Captures a defined purpose.

(2) Is comprehensive for multiple purposes.

(3) Distinguishes an output from others.

(4) Can be counted accurately.

(5) Provides a tested, valid count.

(6) Captures full costs.

(7) Is a validated proxy.

FIGURE 1-6

A SCHEMATIC PRESENTATION OF ACTIVITIES IN DECIDING ON EDUCATIONAL POLICY