

I. PROJECT IDENTIFICATION

1. PROJECT TITLE

EDUCATIONAL COMPUTERS MEASUREMENT

APPENDIX ATTACHED

YES  NO 21p

2. RECIPIENT (Specify)

COUNTRY

REGIONAL

INTERREGIONAL Non-Worldwide

4. LIFE OF PROJECT

BEGINS FY 73

ENDS FY 74

2. PROJECT NO. (M.O. 1025.2)

931-11-690-994

5. SUBMISSION

ORIGINAL 12/22/72

REV. NO. \_\_\_\_\_ DATE \_\_\_\_\_

CONTR./PASA NO. \_\_\_\_\_

II. FUNDING (\$000) AND MAN MONTHS (MM) REQUIREMENTS

| A. FUNDING BY FISCAL YEAR | B. TOTAL \$ | C. PERSONNEL |        | D. PARTICIPANTS |        | E. COMMODITIES \$ | F. OTHER COSTS \$ | G. PASA/CONTR. |        | H. LOCAL EXCHANGE CURRENCY RATE: \$ US _____ (U.S. OWNED) |                  |  |
|---------------------------|-------------|--------------|--------|-----------------|--------|-------------------|-------------------|----------------|--------|---|------------------|--|
|                           |             | (1) \$       | (2) MM | (1) \$          | (2) MM |                   |                   | (1) \$         | (2) MM | (1) U.S. GRANT LOAN                                       | (2) COOP COUNTRY |  |
|                           |             |              |        |                 |        |                   |                   |                |        | (A) JOINT   | (B) BUDGET       |  |
| 1. PRIOR THRU ACTUAL FY   |             |              |        |                 |        |                   |                   |                |        |   |                  |  |
| 2. OPRI FY <u>73</u>      | <u>150</u>  | <u>150</u>   |        |                 |        |                   |                   |                |        |   |                  |  |
| 3. BUDGET FY <u>74</u>    | <u>75</u>   | <u>75</u>    |        |                 |        |                   |                   |                |        |   |                  |  |
| 4. BUDGET +1 FY           |             |              |        |                 |        |                   |                   |                |        |   |                  |  |
| 5. BUDGET +2 FY           |             |              |        |                 |        |                   |                   |                |        |   |                  |  |
| 6. BUDGET +3 FY           |             |              |        |                 |        |                   |                   |                |        |   |                  |  |
| 7. ALL SUBQ. FY           |             |              |        |                 |        |                   |                   |                |        |   |                  |  |
| 8. GRAND TOTAL            | <u>225</u>  | <u>225</u>   |        |                 |        |                   |                   |                |        |   |                  |  |

9. OTHER DONOR CONTRIBUTIONS

| (A) NAME OF DONOR | (B) KIND OF GOODS/SERVICES | (C) AMOUNT |
|-------------------|----------------------------|------------|
|                   |                            |            |

III. ORIGINATING OFFICE CLEARANCE

|  |                          |                  |
|--|--------------------------|------------------|
| 1. DRAFTER<br>TA/HR, R. W. Schmedding          | TITLE<br>Project Manager | DATE<br>12/22/72 |
| 2. CLEARANCE OFFICER<br>TA/HR, John P. Hillier | TITLE<br>Director, TA/HR | DATE<br>12/22/72 |

IV. PROJECT AUTHORIZATION

1. CONDITIONS OF APPROVAL

2. CLEARANCES

| BUR/OFF. | SIGNATURE                       | DATE | BUR/OFF. | SIGNATURE | DATE |
|----------|---------------------------------|------|----------|-----------|------|
|          | <u>D.G. Mathiasen, AAA/TA/F</u> |      |          |           |      |
|          |                                 |      |          |           |      |

3. APPROVAL AAAs OR OFFICE DIRECTORS

SIGNATURE [Signature] DATE 1/30/73  
TITLE Technical Assistant

4. APPROVAL A/AID (See M.O. 1025.1 VI C)

SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_  
ADMINISTRATOR, AGENCY FOR INTERNATIONAL DEVELOPMENT

January 18, 1973

MEMORANDUM TO: AA/TA, Mr. Joel Bernstein  
FROM: TA/PM, David G. Mathiasen <sup>DGM</sup>  
SUBJECT: PROP, Educational Outputs Measurement

Transmitted herewith is the PROP, Educational Outputs Measurements. This project was reviewed at the GTSC meeting on December 7, 1972, and the PROP has been circulated to all members.

We received favorable and supporting comments from each regional bureau and central engineering. There are no major problems. Some suggestions were made and Bob Schmeding has assured us that in each case he will take the appropriate action to respond to bureau request.

TA/PM recommends that you assign the attached PROP.

Attachment: a/s

*Approved*  
1/30/73  
*[Signature]*

Narrative Description: Educational Outputs Measurement

A. Statement of the Goal

The broad goal of the Key Problem Area of Educational Finance and Measurement is to establish a fuller range of resources for LDCs to utilize in (a) identifying and using alternative means for financing education, and (b) identifying, evaluating, and correcting educational system inefficiencies.

What is being sought is a material increase in three major types of resources:

1. Human, meaning experts and specialists working in the KPA. The objective is to identify such persons so that the LDCs have available to them an increasingly greater number than when KPA activity began in 1969.
2. Institutional, meaning associations of people working in a particular physical setting. By 1/1/74, the target is to have at least one U.S., and two or more LDC institutions at work in the KPA. Where and as possible support and encouragement will be given to international agencies to the end that all three types of institutions may be better enabled to collaborate in the KPA.
3. Informational, meaning basically the printed word, as for example, descriptive data, research findings, strategy statements, program documentation, and analysis, implementation and evaluation methodologies. The Inventory-Classification (Harvard Project) of activities in educational finance and measurement will be completed in early 1973. In addition, the target by 1/1/74 is to have several handbooks and/or other analytical tools produced, two or more international conferences convened, and at least one AID-supported research project underway. Where opportunities arise, field projects in the KPA will be encouraged and supported.

It is assumed that the realization of LDC educational objectives at all levels will be substantially impaired unless more effective and efficient education finance and measurement approaches are developed and applied.

B. Statement of Project Purpose

The purpose of the project of this PROP is to improve awareness and understanding of methodologies for evaluating educational outputs, so that LDC planners and managers can better appraise the efficiency of operation of their education programs, and obtain better measures of benefits derivative from education.

It is expected that at the end of the project, the utility of output measurement methodologies will be verified by actual employment

of these methodologies by IDC planners and managers in organizing and carrying out educational activities. It is assumed that methodologies for measuring educational outputs are neither well developed nor widely employed, and generalizations of benefits and system inefficiencies require improved methodologies. It is further assumed that improved methodologies for evaluating educational system outputs will have critical impact on the process of structuring formal and non-formal educational programs to address development needs in IDCs.

C. Statement of Project Outputs

Several outputs are planned.

[One, a firm collaborative relationship will be established between a U.S. and an IDC institution.] This relationship will be established through the involvement of the two institutions in a partnership enterprise, including all aspects of the work from earliest project design decisions to day-to-day implementation of design and management of the several elements of the undertaking.

[Two, a handbook will be produced which will be organized first to show the different types of outputs of education activities in a typology. Next, the handbook will examine the various existing and possible new methodologies for measuring such outputs. Each separate methodology will be descriptively summarized, with strengths and weaknesses noted, and illustrations from actual practical employment of certain methodologies included where possible. These "illustrations from practice" will include IDC examples to as great a degree as possible. The handbook will be written in a fluid, uncomplicated style with emphasis upon a non-technical exposition.

Three, a set of prototype designs for field research will be developed as an output of the project. These designs will be formulated in such a fashion that they can be turned over to agencies interested in supporting the research indicated. It is expected that the field research project ideas will be generated in large part from the work leading to the production of the handbook. While research is needed to advance the "State-of-the-art," in the sense that new methodologies can and should be developed, there is perhaps a greater need to [field-test existing measurement methodologies in order to improve their power and utility, especially in the IDC context.] This issue of which types of research are most needed is one that the two collaborating organizations must face. The research they suggest, and for which they will provide designs, should be reflective of felt needs in IDCs insofar as educational outputs measurement is concerned.

Four, a plan will be produced, outlining a procedure for the most effective dissemination of the handbook, in order to a) get it distributed in timely fashion and b) get it into the hands of those people who can make best use of it.

Five, a report will be produced recounting the results of an international conference to be convened as a part of the project. This conference will involve

LDC planners and managers, together with experts in the outputs measurement field, do a review of elements of the handbook and other project-related matters.

Six, a report will be produced, which will be an accounting in narrative form of the entire project from its beginning to its conclusion, with particular emphasis upon the experience of the two institutions with the collaborative venture, and recommendations for ways to make future such partnership projects as this one truly effective undertakings, citing problems and pitfalls to be avoided.

Indicators of output will be three in number. The first such indicator will be the actual completion of the project, according to schedule, through the joint efforts of the U.S. and LDC institutions. The second indication will be the production of 2,000 copies of the handbook and their distribution according to the dissemination plan that has been developed. The third objective indicator will be the distribution of field research designs to agencies interested in supporting such research.

It is assumed about outputs that the LDC institution will have the support of its government in the collaborative venture, and moreover that the two institutions can work effectively together. It is further assumed that the handbook represents a useful means for disseminating outputs measurement methodology.

#### D. Statement of Project Inputs

A contract will be signed with a U.S. institution to be the "catalytic agent" for initiating the collaborative enterprise. This institution will then identify the LDC institution and its staff, with which it will carry out the project. These two groups will form the major input to the project.

In selecting the collaborating organization, the Contractor shall make every effort to involve LDC people who have close engagement with the public sector, especially with Ministry of Education personnel whose program responsibilities and needs are closely related to educational outputs measurement. It is important that the Contractor not link up with an LDC group which has little, if any, day-to-day association with practical educational program operations. In addition, it would be highly desirable if at least one LDC person associated with the LDC collaborating organization be seconded or assigned from the Ministry of Education of that LDC to work in the project.

[In addition, a group of world experts in measurement of educational outputs will be identified to advise the two partnership institutions as consultants. In addition to the staff of the cooperating LDC institution, additional scholars and officials from other LDCs will participate in a conference and offer advice and counsel to the project.]

A final input will be the guidance and suggestions offered by USAIDs, Regional Bureaus, and other AID/W personnel.

BUDGET SUMMARY

Salaries

U.S. Associate Director 18 man months @ \$1500 \$ 27,000  
 LDC Associate Director 16 man months @ 800 12,800

3 Research Assistants:

U.S. 18 man months @ \$500 10,800  
 U.S. 16 man months @ \$500 9,600  
 LDC 16 man months @ \$400 6,400

Secretarial

U.S. 18 man months @ \$400 7,200  
 LDC 16 man months @ \$200 3,200

Staff Benefits:

15% for U.S. personnel (15 x \$54,600) 8,190  
 7% for LDC personnel (07 x \$22,400) 1,568

Sub-Total, Salaries \$ 66,758

Consultants

For producing papers: estimate 8 experts @ \$1500 \$ 12,000  
 Other consulting: estimate 20 man days @ \$100 2,000

Sub-Total, Consultants \$ 14,000

Conference Costs

Inclusive of travel, per diem, conference site rental, other associated costs \$ 30,000

Travel & Per Diem

Estimate 10 round trips @ \$1500 for conferences between U.S. and LDC groups \$ 15,000  
 Per Diem (estimate 15 days @ \$30 x 10) 4,500  
 Other Consultant travel and per diem 2,000

Sub-Total, Travel, Per Diem \$ 21,500

Publication Costs

For handbook, conference report 7,000

Supplies, Materials, Other Costs

For both U.S. and LDC offices 3,000

62,000

Overhead

\$ 224,258

With respect to the management of inputs, it is assumed that the U.S. institution, immediately after signing the contract, will be able to work out procedural and operational details with the cooperating LDC institution. Because the project is to be completed in eighteen months, it is quite important that the two institutions not delay in making their arrangements for putting all inputs together in an effective amalgam.

**E. Rationale.** The need for increased attention to evaluation of educational system outputs has been recognized by educational planners, economists, and development specialists for some time. A series of special meetings and discussions on this topic was instituted on November, 1970, by interested representatives of a number of agencies. The Problem Area Manager has been a party to these deliberations, and the project description set forth here addresses the need to do something in this important area.

Educational "outputs" may refer to both quantitative and qualitative elements. On the one hand, we may consider the numbers of persons educated to different levels, and on the other, the amount and character of the knowledge such persons have obtained, the skills they have mastered, changes in their ability to cope with problems of living, and the inculcation of certain attitudes. These elements, as they are secured through the educational process, represent "values" added to student "input."

Better evaluation of outputs is important to the problem area for two reasons. The first has to do with the determination of the return, or private and social benefits accruing from investments in education. Any such determination requires some translation of the educational values noted above into economic values, such as increased productivity and higher income. A well-known and much publicized method is the rate-of-return approach, undergirding cost-benefits analysis, in which characteristically the earnings of graduates of different levels of education are compared with earnings of non-graduates.

But earnings, which are the essence of rates-of-return, are not solely the result of education programs, but also reflect the motivation, innate ability and other personal characteristics of workers, and the vagaries of the wage structure of a given country's economy. Moreover, age-education-earnings profiles, the basis of rate-of-return calculations, reflect past and present supply and demand conditions rather than future conditions, which is what the planner must give prime attention to. While there are upward and downward "corrections" which can be applied to rate-of-return calculations to adjust for some of the foregoing variables, it is nevertheless true that a better translation of educational values into economic values, and determination of benefits derivative from education will come about through improved evaluation of the outputs of the educational process.

Evaluation of outputs is important for a second reason. This has to do with the matter of internal efficiency, essentially the question, "What changes can be made to enhance the value of output for each unit of input?" If one thinks in terms of the input-output model by which most production processes may be characterized, and looks at education as a type of production process, it

is clear that there are at least three major types of modification that can be applied to improve the effectiveness of the educational system.

First, a more cost-effective "mix" of resource inputs can be secured. For example, planners might consider the alternative of using instructional television to supplement the relatively untrained teachers currently available, as against hiring greater numbers of well-trained teachers. Second, the technical operation of the educational system might be improved, embracing all of those measures that would insure better use being made of the resources that are available, as for example, improved budget systems, fuller utilization of supervisors, and changes in scheduling. Third, the priorities among educational outputs can be reordered, so that the educational production process turns out more of those yielding high benefits. Here we are concerned with basic system objectives. For example, can greater benefits be realized through investment in secondary as opposed to higher education; should investment in technical and vocational secondary education be favored over investment in general secondary education?

All of these, concerned with the matter of internal efficiency, relate to the product or output of the educational system, and to better evaluate that output is to provide a more useful benchmark for improving system efficiency. In other words, when and as changes are made within the educational system, we need to know if the value of the outputs has been enhanced.

From the standpoint of the Key Problem Area, outputs' evaluation with reference to system efficiency is important for providing one means of bringing about lower costs in operation of education programs. Because education is requiring increasingly larger percentages of national budgets, it is imperative on the one hand that we learn if the money being spent is producing desired results, and doing so as economically as possible.

On the other hand, with reference to the benefits of education, measures are needed to better inform us if investments in education are competitive with alternative investments in other sectors. One conclusion of rate-of-return studies in several countries is that returns to education in most cases exceed returns for other kinds of investments; the payoff for investing in men seems to be higher than that for investing in "machines." What is needed is further refinement of measures to help us determine which types of cognitive learning and skills' mastery produces the highest yield, or "pay-off," in the market-place. Additionally we can profit from better measures of the attitudes school leavers carry with them, and the extent to which such attitudes affect success in later life, in improved performance in jobs, and in adopting modern health, nutritional and family planning practices and assuming more responsible citizenship roles.

For purposes of outputs' evaluation, experts in the field suggest that the matter of system efficiency implies that some form of measurement instruments can determine the initial status of individuals (and groups) and the ensuing value-added or changes resulting from the educational experience. Further, experts suggest that with measures of outputs, sufficient information can be obtained relating educational operations and inputs to the determined results, essentially the question of cost efficiency; and that the results of measuring educational



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finance specialists currently working on the GTS project funded by our Office (Inventory-Classification of Activities in Educational Finance.)

The American institution selected as Contractor would take at least the following steps: (1) identify an LDC educational or social science research institution with which to collaborate in the project; (2) together with the LDC institution to (a) constitute an advisory panel of consultants knowledgeable in outputs' evaluation; (b) commission a number of experts (advisory panel members and others) to produce papers in which they would describe existing and new methods of measuring outputs for LDCs for different levels and types of education, analyzing strengths and weaknesses and showing means of actually applying such methods; (c) convene a conference of LDC educational and/or social science research scholars to consider the papers and the relevance for LDC application of the methods of outputs' evaluation presented; the conference would also review suggestions for needed high priority field research vis-a-vis outputs' evaluation, including trial of certain methodologies; and (d) produce designs for those research projects deemed to have highest priority.

The project should be designed to require not more than 18 months. A suggested time-phasing plan is given here. The first five months might be given to the identification and arrangement of collaborative action with the LDC institution and to laying plans for the project; the next three months to the identification of world experts and setting them to work on their papers; the following five months would be used for writing the papers, identification of LDC participants for the conference, and convening it; the final five months would be used for the writing and preparation of several products: a handbook describing different outputs' measurement methodologies; project and conference final reports; a set of action research designs; and a plan for the most effective dissemination of the handbook, involving such possibilities as a series of regional seminars, or the organization of a "traveling seminar." It is important that this dissemination plan address at least these two questions: 1) How can the handbook be distributed in timely fashion? 2) How, with a reasonable degree of certainty, can we get copies of the handbook into the hands of those LDC people who can make best use of it? This second point is essentially the question of "audience." Inasmuch as the handbook is intended to be an informational resource for LDC educational decision-makers, planners and managers, it is vital that these kinds of "practitioners" have access to the finished product.

G. Special Management Provision

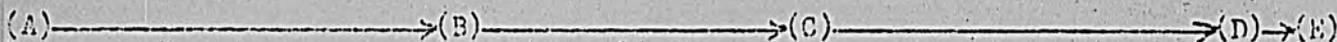
In selecting the LDC organization with which it proposes to collaborate the U.S. organization (Contractor) shall notify the Project Manager of AID/W, who shall take the necessary steps to obtain Regional Bureau and USAID approval for the involvement of the LDC organization. The working out of final arrangements between the two collaborating organizations shall be contingent upon receipt of such approval.

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PERT CHART-MAJOR TASKS

(Months)

0      2      4      6      8      10      12      14      16      18



| Steps | Events | Description   | Processes   | Responsible Agent           | Time (months) |
|-------|--------|---|---|-----------------------------|---------------|
| 1     | (A)    | Sign contract with U.S. university.                               |   | AID/PROC/CSD;<br>AID/TA/EHR | -             |
| 2     |        |   | (A-B) Select LDC university;<br>Design project plan;<br>Select paper writers<br>and assign topics.                          | U.S., LDC<br>institutions   | 6             |
| 3     | (B)    | All papers in hand.   |   | "                           | -             |
| 4     |        |   | (B-C) Work on Handbook;<br>Research designs;<br>Conference planning.  | "                           | 1 1/2         |
| 5     | (C)    | Convene International Conference                                  |   | "                           | -             |
| 6     |        |   | (C-D) Work on conference report;<br>Final Handbook draft;<br>Final draft, research<br>designs; Plan for dissemi-<br>nation. | "                           | 6 1/2         |
| 7     | (D)    | Handbook disseminated   |   | "                           | -             |
| 8     |        |   | (D-E) Work on final project<br>report.  | "                           | 1             |
| 9     | (E)    | Final project report<br>submitted to AID/W;<br>Project concluded. |   | "                           | -             |

(The Project Manager maintains a detailed PERT Chart for his use.)

Project Title Educational Outputs

FY 1974 International Technical Assistance Project and Budget Analysis Report

Dispositions: Begin FY 1973 End FY 1974  
 Work: Begin FY 1973 End FY 1974  
 POC status: ~~POC~~ approved thru FY 1973  
 Required in FY 1973  
 Estimated Submission Date Dec. 1972  
 month year  
 Evaluation Schedule Sept. 1974, Final  
 month year type

Project Manager R.W. Schmeding Extension 29754  
 Contractor/P.A. Contractor No.  
 Contract P.A.S.A. Extension

Worldwide Major Country/Countries

| Narrative  | Objectively Verifiable Indicators  | Important Assumptions and Progress to date  |
|--|--|---|
| <p><b>B1 PURPOSE:</b></p> <p>To improve awareness about and understanding of methodologies for evaluating educational outputs, so that LDC planners and managers may better appraise the efficiency of operation of their education programs, and obtain better measures of benefits derivative from education.</p>  | <p><b>B2 End of Project Status:</b></p> <p>Output measurement methodologies have demonstrated utility and represent a refinement in outputs evaluation as verified by actual employment of these methodologies by LDC planners and managers in organizing and carrying out educational activities.</p>   | <p><b>B3 Assumptions for Achieving Purpose:</b></p> <ol style="list-style-type: none"> <li>Methodologies for measuring educational outputs are well developed nor widely employed, and current determinations of benefits and system inefficiencies require improved methodologies.</li> <li>Improved methodologies for evaluating educational system outputs will have critical impact on the process of structuring formal and non-formal educational programs to address development needs in LDCs.</li> </ol> |
| <p><b>C1 OUTPUTS:</b></p> <ol style="list-style-type: none"> <li>Firm collaborative relationship established between U.S. and LDC institutions.</li> <li>Handbook describing different outputs evaluation methodologies.</li> <li>Plan for the most effective dissemination of the handbook.</li> <li>Project and conference final reports.</li> <li>Set of field research designs.</li> </ol> | <p><b>C2 Output Indicators:</b></p> <ol style="list-style-type: none"> <li>Project completed through joint efforts of two institutions.</li> <li>2000 copies of handbook printed and distributed according to plan ("traveling seminars," regional seminars, etc.)</li> <li>Field research designs made available to agencies interested in supporting such research.</li> </ol> | <p><b>C3 Assumptions for Achieving Outputs:</b></p> <ol style="list-style-type: none"> <li>IDC institution fully supported by its government in the collaborative undertaking with the U.S. institution.</li> <li>Two institutions can work effectively together.</li> <li>Handbook of evaluation approaches represents an effective means for disseminating methodology.</li> </ol>  |

**D1 INPUTS:**

- U.S. institution (contractor) will provide staff, in collaboration with:
- LDC institution, which will provide staff.
- Group of world experts will provide written guidance materials and serve as consultants.
- LDC educational and social science research scholars will provide advice and counsel.
- USAYDs and Regional Bureaus will identify LDC participants for project.

D.2 Budget Summary (in thousands of dollars)

|                              | (1)        |           | (2)          |             | (3) | (4) | (5) | (6) | (7) | (8) | (9) | Terminal |             |
|------------------------------|------------|-----------|--------------|-------------|-----|-----|-----|-----|-----|-----|-----|----------|-------------|
|                              | Personnel  | Materials | Participants | Commodities |     |     |     |     |     |     |     |          | Other Costs |
| All Prior Years Thru FY 1971 |            |           |              |             |     |     |     |     |     |     |     |          |             |
| Actual FY 1972               |            |           | XX           |             | XX  |     |     |     |     |     |     |          |             |
| Estimated FY 1973            | 150        |           |              |             |     |     |     |     |     |     |     |          |             |
| Proposed FY 1974             | 75         |           |              |             |     |     |     |     |     |     |     |          |             |
| All Other                    |            |           | XX           |             |     |     |     |     |     |     |     |          |             |
| <b>Total</b>                 | <b>225</b> |           |              |             |     |     |     |     |     |     |     |          |             |

\*Key Problem Area, Area of Concentration, or Field Report

|             |                                   |                                   |          |      |                     |
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APPENDIX A

CONFERENCE REPORTS BEARING ON OUTPUTS EVALUATION

The Second Regional Conference on Education (Bangkok, 1965) made a number of recommendations, among which the following bear on outputs evaluation:

- Structural reorientation of education systems . . . .
- Implementation of systematic programs for reducing the incidence of wastage.
- Development of educational research for qualitative improvement at all levels and types of education.

The Conference on Education in the Arab States (Tripoli, 1966) recommended among other things the following measures: "to evaluate carefully the effectiveness of the educational system, to develop educational testing and guidance methods and to undertake and conduct educational research in every Arab country." (Quoted in the Final Report, Third Regional Conference of Ministers of Education and Ministers Responsible for Economic Planning in the Arab States, Washington, 12-20 Jan., 1970 (Paris: UNESCO, 27 April 1970), p. 11.)

At the Nairobi Conference in July, 1968, the following points were made:

"The causes of the present (educational) situation are many and varied. The first one of course is the inadequacy of financial resources in relation to the needs . . . unfortunately many African governments have almost reached the limit of their financial effort . . . But financial stringency is by no means the only cause. The unsatisfactory output of educational systems is also to be blamed." (p. 12)

The International Conference on Education Planning (Final Report, Paris: UNESCO, 30 Oct., 1968) noted that,

". . . Stress was also placed on the need to make more effective use of the financial resources already available. The problem of the internal efficiency of the educational systems and of their external productivity was possibly one of the greatest challenges faced by educational planning and administration." (p. 13.)

"Educational objectives need to be better defined. For example rather than setting a certain duration of school attendance as an objective in itself it would be more suitable to assess the effect of such an attendance on, for example, the cultural level, or technical qualifications of citizens and to see whether the same or more productive results might not be obtained more economically from other forms of education."

... Another consequence of this comprehensive definition of education is a redefinition of output measurements. By the blending or combination of various means to achieve set objectives; it might be found that considerable increases in productivity may be obtained. These however can no longer be measured in terms of years of attendance only. Before such spectacular changes take place it is essential that considerable progress be achieved in measuring educational output." (pp. 16-17)

The Marrakesh Conference /Final Report, Third Regional Conference of Ministers of Education and Ministers Responsible for Economic Planning in the Arab States, Marrakesh, 12-20 Jan., 1970 (Paris: UNESCO, 27 April, 1970).

"The financing of education represents one of the most serious problems. With the present high proportion of public funds devoted to education, it will be difficult to maintain a steady increase in educational expenditures. On the other hand, most of the educational systems have a low internal efficiency, as may be seen in excessive rates of dropping-out and repeating." (p. 14.)

The most recent conference, in Singapore, identified a "common need"

the "development of an effective machinery for the planning of education and for assessing on a continuing basis the performance of the education system . . . Another problem is related to the operating efficiency of the education systems. The incidence of drop-out, grade repetitions and examination failures continue to be high in many countries; and all available evidence suggests that by and large the achievement levels of pupils under instruction leave much to be desired . . . Generally, periodic evaluation which should be an integral part of every (educational) programme was not adequately developed. /Final Report, Third Regional Conference of Ministers of Education and Those Responsible for Economic Planning in Asia, Singapore, 31 May - 7 June, 1971 (Paris: UNESCO, October, 1971), p. 17./

APPENDIX B

OVERSEER EVALUATION: RELATIONSHIP TO  
EDUCATIONAL SYSTEM EFFICIENCY

(Points of Departure)

by

Nathan Kravetz

International Institute for Educational Planning

Educational system efficiency refers to

- (a) Enrolling the maximum (optimum) numbers of students in the age group, beginning with the earliest years.
- (b) Maintaining enrolments of maximum (optimum) numbers of students throughout the period of the instructional level.
- (c) Internal efficiency:
  - (i) moving numbers of students at minimum loss from one level to the next - (or one course to the next, etc.);
  - (ii) constructing (or modifying) and utilizing school buildings at fullest possible time and with appropriate relevance to curriculum, personnel, community demands, national needs, etc.;
  - (iii) developing and using teaching materials (books, audio-visual materials, laboratories, radio-TV, and other items) at lowest cost, for greatest number of students, with maximum measurable achievement;
  - (iv) development, installation and operation of curricula based upon appropriate and concrete objectives which would serve as criteria for on-going and later evaluation. The curricula would include sequences of teaching-learning activities that implement the objectives and that provide for measurable outputs within the sequences and following them;

(v) training, assigning, and using teaching staff (and other personnel) at best ratios to students, for best time modules, with most relevant and useful support and supervision, in relation to relevant curriculum and previously noted buildings and materials;

(vi) implications of the foregoing:

- that the accomplishment of efficiency can be measured;
- that criteria in terms of objectives can be specified concretely and given some form of quantification;
- that some form of measurement instruments can determine the initial status of individuals (and groups) and the ensuing value-added or changes resulting from the educational experience;
- that various implementation procedures (curricula, school activities, uses of time, plant, materials, and personnel) have different costs and outputs;
- that with the measurement of outputs, sufficient information can be obtained relating educational operations (and inputs) to the determined results, i.e., cost efficiency;
- that the results of measuring educational outputs can be fed back to educational planners for modification of individual or multiple inputs (and processes) so as to increase the efficient use of the inputs.

This measurement of results within the system tends to focus upon the most handy subjects, the students, who are measured on achievement. Such measures are usually of a few highly specific, cognitive areas, that is, of school subjects. It is assumed, following such measurement, that school system efficiency is being evaluated. Internal evaluation is tied in with student progress from one year to the next within each level, from one level to the next, and the achievement of certificates, diplomas and degrees. Such evaluation is assumed to indicate achievement of the objectives of the system.

(d) low external efficiency:

- (i) providing sufficient numbers of school leavers (graduates) to meet the immediate and anticipated requirements for manpower;
- (ii) providing manpower which would represent specifically-trained personnel prepared to work on specific jobs;
- (iii) providing generally-trained manpower which could move into available jobs and receive specific training on-the-job, or others in non-formal processes;
- (iv) providing citizens who are functionally literate and who are able to confront successfully the demands of consumer economics, home and family planning, health and nutritional needs, community-centred organization and development, self-directed leisure-time use, and the responsibilities of citizenship;
- (v) providing citizens with the foundations (and motivations and opportunity) for making use of further education. Reference is to more on-the-job training, additional courses in the formal system for further certificates or degrees, additional learning of newly-developed techniques (in agriculture, crafts production, cultural expression, etc.), opportunities for satisfaction of personal artistic, literary, other individual or group interests;
- (vi) raising the level of participation in the economy: entrance into the 'money system', higher standard of living, greater welfare and social insurance opportunities, increased savings;
- (vii) implications of the foregoing:
  - that external efficiency which is evaluated in terms of numbers of graduates can be related to the effects of school experiences;
  - that the quality of those who hold certificates, diplomas or degrees should also be susceptible to measurement;
  - that indicators of output quality (job-getting, job-holding, occupational upward progress, etc.) can be identified concretely and measured in objective form;

- that the achievement of foreign students in non-cognitive areas of living and work can be measured;
- that such measurements of output quality can be correlated with educational objectives, curricula, and experience, and determined to be the result of the formal educational system;
- that objective measures of the output of non-formal educational operations (literacy, special programmes in agriculture, on-the-job training, artisan development, community betterment programmes, health and/or family planning education, etc.) can be developed and applied for purposes of new planning and revised inputs.

Problems of educational output which need study

(a) Internal evaluation:

- (i) definition and disaggregation of system objectives;
- (ii) translation of disaggregated objectives into behaviour-oriented curricular processes;
- (iii) movement within the system;
- (iv) repetition-dropout;
- (v) transition between levels;
- (vi) testing of student achievement;
- (vii) evaluation of professional personnel (accountability).

(b) School system process evaluation:

- (i) curriculum orientation to objectives, student needs, community realities;
- (ii) methodologies of instruction expressing objectives, and related to student development levels and teacher skills;
- (iii) utilization of plant, equipment, teaching materials;
- (iv) relevant adaptation of audio-visual media, programmed materials, new technology.

(c) School system organizational evaluations:

- (i) structures and operations of administration;
- (ii) communication flows within the structures of systems;
- (iii) systems and operations of teaching supervision and support;
- (iv) the functioning of teacher education (pre-service, in-service);
- (v) the apparatus for system planning and evaluation;
- (vi) the organization and application of research and development resources;
- (vii) the costs of education and of educational evaluation efforts.

(d) External evaluations:

- (i) numbers and types of certificate-holders, degrees, and diplomas produced; variations in quality determined with regard to such awards;
- (ii) employment of system-produced manpower and areas of unfulfilled manpower requirements;
- (iii) determination and quantification of post-schooling and long-term indicators which reflect school system objectives and which are demonstrated to result from educational inputs;
- (iv) development of evaluative methodology to determine achievement of indicators.

(e) Problems of evaluative methodology:

- (i) objective-based reference criteria;
- (ii) relation between objectives and quantifiable inputs and processes in education;
- (iii) evaluation of non-cognitive (affective) objectives as outputs;

(iv) effects on outputs of educational variables (formal and non-formal) and effects of capital, personnel, and other variables;

(v) the nature and use of incomplete, doubtful, or dirty data;

(vi) test instrument construction and validation.

(f) Evaluation results as system inputs

Feedback to the system of results of evaluation so as to modify objectives, uses of resources, internal processes, structures, and further evaluation procedures.

(g) Future methodology linking evaluation to planning

Problems of expertise in application of future methodology to developing countries.

UNITED STATES GOVERNMENT

# Memorandum

9310994

TO : AA/TA/PM - Mr. David Mathiasen

DATE: February 21, 1973

FROM : TA/EHR - John F. Hilliard

SUBJECT: OYB Funding for TA/EHR Projects

We have been advised that the funding for the proposed new GTS project, Education Outputs Measurement (total: \$225,000, of which \$150,000 is scheduled for FY 1973 and \$75,000 for FY 1974) is inadequate to meet the contractor's budget (Georgetown University, \$252,000). We therefore want to shift \$27,000 to this project from the \$250,000 allotted for the Educational Technology Field Support Project, reducing the FY 1973 funding level for the latter to \$223,000.

TA/EHR:RSchmeding:sd

