

9310090(7)
PD-AAC-544-C1

RECEIVED

DRAFT

177 JUN 8 AM 11 73

22p.

SERVICES

ECONOMIC ANALYSIS AND EDUCATIONAL MEDIA ANALYSIS:

FIRST YEAR REPORT

UNDER CONTRACT WITH USAID TO EDUTEL Communications & Development, Inc.

Contract No. ta-C-1348

Project Director: Stuart J. Wells

Principal Investigators: A. L. Horley, S.J. Klees, S.J. Wells

Contributors: J. Leslie, S. Russell, L. Brekka

June, 1977

EDUTEL

COMMUNICATIONS AND DEVELOPMENT, INC.

701 WELCH ROAD, SUITE 225, PALO ALTO, CALIFORNIA 94304 • 415/328-4972

600 E STREET, SUITE 100, WASHINGTON, D.C. 20004 • 202/638-4238

I. GENERAL INTRODUCTION

This paper summarizes the results of a year of work under EDUTEL Communications and Development, Inc.'s contract with the United States Agency for International Development, Contract No. ta-C-1348, to examine various facets of the relationship between economic analysis and educational decision-making with respect to the use of educational technologies in low income nations. We view our work on this contract in the context of broad, closely related thrusts being undertaken within AID and internationally. It is thus important to view our first year activities and plans for the second year within this context.

Within the Agency for International Development there is a long history of interest in the potential for new educational technologies to aid in the provision of various types of educational services. The Technical Assistance Bureau has an office concerned specifically with such applications and their support yielded a number of initial studies examining the relationship of economic analysis to these questions. One result of these efforts was the cost analysis state-of-the-art paper of which the principal investigators of this contract were co-authors (*Cost Analysis for Educational Planning and Evaluation: Methodology and Application to Instructional Technology Systems* by D. Jamison, S. Klees and S. Wells, published by USAID, 1976, forthcoming book by Sage Publications, Inc., Beverley Hills, CA). The work we are currently engaged in clearly builds on these efforts.

Additionally, also within AID, this contract is only one component of a concerted effort to examine the potential for systematic analysis as an aid to educational decision-making. Again, there is a specific office within the Technical Assistance Bureau associated with such efforts and

our contract is one of three begun last year to further this work. The other two contracts -- one with Educational Testing Service in the area of economic analyses of non-formal educational alternatives, and one with Harvard University on the general application of economic analysis to educational planning -- deal with both methods and substance integrally related to our concentration.

Finally, on an international level, there are a number of individuals and groups working specifically in applications of economic analysis to educational technology utilizations. Our work was specifically intended by AID to be viewed in the context of the state of the art of this general field.

All of the efforts broadly described above have formed a background which has taken on operational significance through a variety of professional relationships developed. Close initial contact with individuals at AID in Washington (especially the Advisory Committee), in the field, and with the Educational Testing Service and Harvard contractors guided the shape of our effort. A variety of mechanisms led to our sponsoring an international meeting at which about 60 professionals specifically involved in our field convened in early March of 1977 to discuss the state of the art of "Economic Analysis of Educational Media" (March 2-4, 1977, Washington, D.C.).

The development of economic analytic tools in general, as they apply to educational decision making, is clearly recognized as having considerable room for growth. Applications specific to technology alternatives are relatively scarce.

Given the nascent state of the field in which we are working, we have viewed our efforts as developmental. Clearly there is more work to be done

than we can do under this contract. Although the contract spells out specific tasks and areas to be addressed, there is enough flexibility within such categories to allow us to focus on those areas that seem most promising. We have tried to use that flexibility well. We have benefitted considerably from the interaction with our project officer, Wilbur Waffle, who has encouraged such flexibility and responsiveness to a quickly changing field.

In Part II of what follows we will describe the variety of activities undertaken during the first year of this contract, which we feel have been quite rich and professionally rewarding, as a whole representing a major development in the application of economic analysis to the examination of educational technologies. In Part III we describe plans for the second year of the contract.

II. FIRST YEAR ACTIVITIES -- JULY, 1976 -- JULY, 1977

In this section, we discuss our efforts via each of the primary activity areas examined and conclude with a general discussion of various related activities in which we engaged.

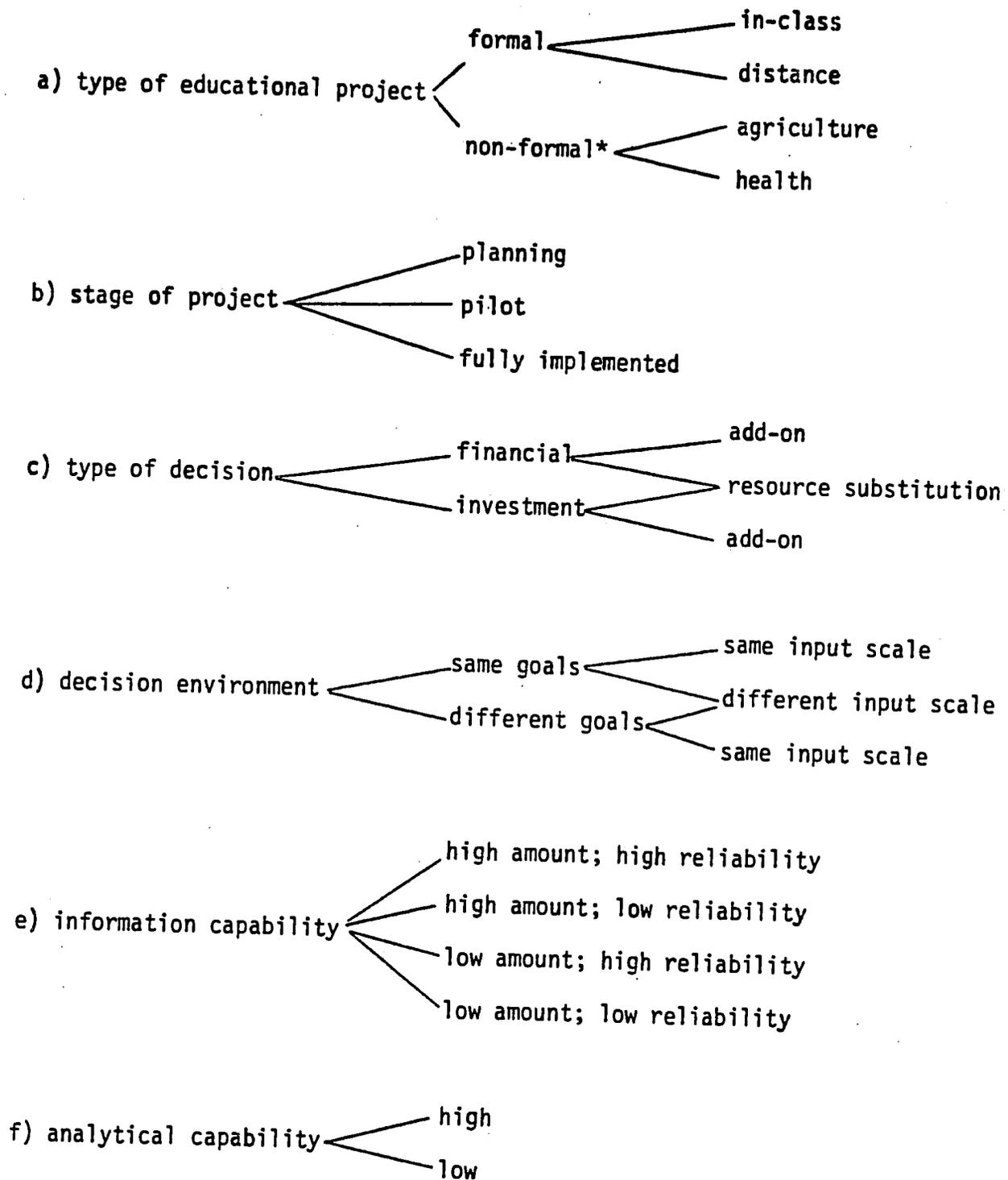
A. Typology

One of our first efforts on this contract was to attempt to categorize the main dimensions along which to select case studies and to apply the economic analysis methodologies being investigated. Annex A presents the paper we put together detailing these general typological criteria and discussing their importance. For convenience, Figure 1 of that paper is reproduced below. As we see it, the typology is based on five primary characteristics which are subdivided into heuristically useful (not mutually exclusive or exhaustive) categories.

In November, 1976, we had the opportunity to discuss this scheme with colleagues from Educational Testing Service, Harvard, and within the Agency for International Development. In some ways, the different schemas of the different contractors meshed quite nicely, perhaps in some sense representing country, sector, and project categorizations, respectively. The decision was made at this meeting to have each contractor continue to use their own schema for their activities.

We have, in our work this first year, done exactly that, in the sense of using these criteria as guidelines for the focus of methodological discussions and case study selections. As we emphasized in the paper, however, there are clearly more categories than we have the potential to examine under this contract. Thus, a mixture of professional judgment as

Fig. () TYPOLOGICAL CRITERIA



*Given the wide variety of goals of non-formal educational projects, we propose to limit our work under this contract principally to those concerned with improvement in agricultural productivity or health. This selection reflects the obvious importance of these types of activities, especially for the rural poor, as well as their amenability to economic analysis.

to the most serious gaps in the existing literature, combined with the flexibility to respond to interests in the field, in AID, and in other contracts, have served to fill in and more precisely direct our activities as we will discuss below.

B. Cost Manual

One important contract activity this year has been focussed on translating the cost analysis state-of-the-art paper done previously by Jamison, Wells and Klees into a manual form that can be read and understood by non-economists. The purpose is not to offer a self-contained do-it-yourself guide to cost analysis, but rather to explain clearly the issues involved, the approaches taken, and, if supplemented by additional future training and dissemination activities, to promote local capabilities to undertake cost analyses.

Although we initially had planned to undertake the cost manual early in the contract year (and indeed, began it then), during the course of the year we reversed our priorities, with the agreement of the Agency for International Development, and began early work on the cost-effectiveness and cost-benefit analysis state-of-the-art paper, and postponed work on the cost analysis manual until late in the contract year. The primary reason for this was the "Economic Analysis of Educational Media" conference which we organized this year and held in early March (see Section II.E, below, for a brief discussion). It was felt that, given such an international gathering of experts in the field, we should focus on state-of-the-art discussions at the meeting, and let the "translation" (from economicese to English) that the manuals represent reflect the outcomes of these discussions.

We feel such a reversal of task priorities turned out to be an excellent idea. We received much feedback on our work to date in the area that was both useful and timely. In terms of the cost manual, while our overall schematic outline for it has not changed (see Annex B), the substantive and contextual issues raised within it have been put in a different focus as a result of the conference discussions. In particular, we have increased our emphasis on the conceptual side of cost analysis as opposed to the purely methodological side, yielding a balance between them that we feel is more in keeping with their utility. This is most clearly reflected in the changed orientation of Chapter III of the manual. Work is currently proceeding on the cost manual and a draft will be completed by the end of the contract year.

C. Cost-Effectiveness/Cost-Benefit Analysis State-of-the-Art Paper

In terms of practical educational decision-making applicability, the state-of-the-art of the economist's tools of cost-effectiveness and cost-benefit analysis is still in its infancy, as most readers are aware. Nonetheless, in recent years, these have been rapid developments in methodological approach and increasing attempts to apply these techniques. Our efforts to survey and critically examine the present state of this field has led to several papers and plans for future work.

First, S. Klees and S. Wells' paper, *Cost-Effectiveness and Cost-Benefit Analysis for Educational Planning and Evaluation: Methodology and Application to Instructional Technology* (attached as Annex C) is the core effort in this regard. It takes an in-depth look at the issues and assumptions surrounding the use of economic analytic methodologies as

applied to educational assessment in general, and to alternative instructional technologies in particular. Additionally, it reviews the rather sparse literature that examines formal schooling use of instructional television and radio systems from this perspective.

The paper by Joanne Leslie and Dean Jamison entitled *Applications of Instructional Technology in Latin America: Cost and Effectiveness*, (attached as Annex D) complements the previous paper by looking more closely at a number of such projects in Latin America. Also a part of the strategy of extending and deepening the analysis provided in the Klees and Wells paper is the examination of educational media utilizations in non-formal as well as formal educational settings. As per our typological criteria, and in parallel with the efforts of the other contractors, particularly Educational Testing Service, we will look at non-formal educational activities in the areas of health and agriculture.

Joanne Leslie's paper entitled *Mass Media for Nutrition Education*, (attached as Annex E), is a first effort to look at some aspects of the health and nutrition field. This will be supplemented next year by a more theoretical look at the economics of health care. Work is currently underway on a paper that looks at the economic analysis of educational activities directed towards agricultural productivity and rural development. In addition to Klees and Wells, Jacqueline Ashby, a doctoral student in developmental sociology at Cornell University, and Douglas Pachico, doctoral student in agricultural economics, also at Cornell University, are collaborating in this effort. An outline of the paper is attached as Annex F, and it will be completed by late summer or early autumn. We have been taken to keep in close touch with work in this regard at Educational Testing Service, and our effort will build on the work done

by Marlaine Lockheed and Kan Hua Young for their contract with USAID.

D. Case Studies

It is important to view our first year's case study efforts at applying economic analysis to educational media alternatives within our assessment of the operational context. In selecting our case study sites, we made the following general assumptions:

1. That from both the substantive viewpoint of the integration of the studies of cost and effect and the practical viewpoint of the start-up costs of field work, it is sensible to, when possible, choose:
 - (a) the same countries as case studies during the first and second years of the contract, or
 - (b) choose effectiveness and benefit case studies where adequate cost analysis has already been done;
2. That to operate within the budget provided for by our contract with USAID necessitates choosing case studies that already have at least partial evaluation results in hand for projects, since field study data collection costs are prohibitively large;
3. That, potentially, additional funds are available for field work, especially that in support of

decision-making needs within host countries or AID missions, either from AID/Washington or AID missions in the field; and

4. That there is a sufficient probability of economies of scale and interaction that make it advisable for some combination of the three contractors to work together on at least one field site.

The four assumptions above form contextual constraints and opportunities within which we apply our substantive typological criteria (see discussion in II.A, above) to the problem of the selection of the best set of case studies.

The typological criteria proposed yield a finite, but large, set of alternative case study characteristics. Of equal importance are four general considerations that, while not reflected in our typology because they are not a focal point of methodological differences, are nonetheless important substantively to the value of our efforts.

First, the type of media utilized or planned to be utilized will affect our selection of case studies. Although there exist many potential alternative technologies around which to organize an educational system structure, it is probably most effective to emphasize only one or two alternatives to traditional formal and non-formal instruction in our basic case studies. Projects that include radio or television as an integral part of their educational programs will be emphasized because of their greater generalizability in terms of interest and application.

Alternative uses of teachers and print media will be investigated systematically as alternatives within projects that consider or use radio or television-based education.

Second, we must consider the generalizability of the field situation and of the decisions faced or to be faced. The more generalizable the situation, the more applicable will be the methods of the analysis used and perhaps even the information generated.

Third, we prefer to be of service to decision-makers within host countries or within AID missions. Nonetheless, we should still be open to examining cases not related to present decisions if the research results will be of sufficient interest. This will be the state of affairs for most cost-benefit analysis of ongoing projects, since by the time the project gets to the stage where benefits may be examined, often the commitment to continue with the project has already been made. Such cases may still be quite worthwhile if they provide important longer run information to other countries, or perhaps influence "direction of program" decisions within the host country.

Fourth, when working within a decision framework, we would prefer to be working in contexts where we have some confidence that the decisions proposed to be made are credible ones that will be made in some way or another. This is important to avoid analyses that neither yield generalizable information nor support realistic decision endeavors. Of related importance is the extent of the host government's interest in the project.

The above four considerations, along with the six typological characteristics, and the four assumptions mentioned previously set the framework

for case study/field site selection. The framework is obviously not a deterministic one; judgment was required in selecting a set of case studies that will yield the most benefits within the parameters of the framework.

Below, we discuss case study activities undertaken during this first contract year: Part 1 briefly describes the studies completed and Part 2 looks at those in which some contact has been initiated.

1. Case Studies Completed:

Iran

The Iranian case study undertaken by Lawrence Brekka is illustrative of the possibility of using computer simulations for planning models. In his endeavor, he chose to restrict his analysis to alternative strategies for teacher training in Iran. This was not a restriction imposed by decision-makers in Iran. The computer model was designed to allow decision-makers to incorporate their own assumptions regarding student-teacher ratios and utilization of television in teacher training institutions. The model, however, does not incorporate the possibility of entering cost information and is, therefore, only a starting point for simulation analysis. (See Annex G for Brekka's paper.)

Ivory Coast

The Ivory Coast has one of the most extensive television systems for elementary education in the world. The utilization of television has enabled the Ivorians to rapidly expand the primary system. However, the same expansion has not taken place at the secondary level. Decision-makers in the Ivory Coast are now faced with the decision of whether or not to expand existing secondary and technical institutions or to create a new three-year post-primary education cycle. The choice

of an education strategy for this new cycle is not being currently restricted. The paper by Stuart Wells (attached as Appendix H) is his contribution to a larger paper being sponsored by the Academy for Educational Development and written jointly with Andre Daniere, Boston College, and EDUTEL consultant, Emile McAnany, Stanford University and Francois Orivel, IREDU, Dijon University. In this paper the potential costs and effectiveness of alternative strategies are being investigated, along with benefits measured in terms of future employment prospects. The paper by Wells is an analysis of the social demand for education and labor markets in the Ivory Coast. (Work on this paper was jointly supported by AID contracts to EDUTEL and AED.)

Nicaragua

The cost analysis paper of the Radio Mathematic Project (RMP) in Nicaragua (attached as Annex I) by Wells and Klees is illustrative of the usefulness of analysis in a highly constrained decision situation. The RMP has been in operation for two years and is being conducted under an AID contract with the Institute for Mathematical Studies in the Social Sciences at Stanford University. The project is being directed by Patrick Suppes, Barbara Searle, and Jamesine Friend. At present, mathematic curriculums have been planned for the first and second grades and implemented only at a pilot stage. Cost analysis was aimed at several major decisions involving this project: the rate of expansion of a curriculum to other schools in the country, the production of curriculums for upper primary grades, and the potential purchase of transmission facilities. There have been several detailed effectiveness studies already conducted and the possibility exists for a detailed cost-effectiveness analysis during the second year of our project.

2. Case Study Activities Initiated

El Salvador

The El Salvador educational television project is one of the most interesting and best studied from an effectiveness and a cost perspective and by now has been operating a sufficient length of time to allow an examination of the economic benefits of an ETV system vis-a-vis a traditional educational system. In particular, it is possible to examine, from various perspectives, the income and economic growth generating potential of the Salvadorean school reform (if any, of course), as well as the effect of the system on broad criteria for social equity between product sectors (rural/urban) and income classes (rich/poor).

Specifically, we have been able to help support the research of a Salvadorean doctoral student in education at Stanford University, Juan Tijiboy, who has had access to a labor market survey that will allow at least certain aspects of the income benefits of ETV systems to be examined. His dissertation will specifically address such questions and should be complete by the end of August. This will likely represent the first benefit study of a media-based formal schooling system.

Guatemala

The Basic Village Education (BVE) project has been operating experimentally for the past two years, providing non-formal radio-based agricultural education to adults in rural areas. The program has been AID supported and evaluation is on-going through the Academy for Educational Development (with some subcontracts to a team at the University of South Florida). The experimental program was well controlled, very interesting data has been collected, and we hope to contribute to putting that data

together within an analytic, decision-oriented framework. The government of Guatemala is committed to taking over the experimental program and expanding it, so our analyses could contribute to on-going decisions. As a result of Klees' trip there last year, the AID mission has expressed interest in our working there. Howard Ray and Stephen Mosely, of AED, also expressed interest in our combining efforts in this analysis. Further, the existence of cost, effectiveness, and benefit data for educational programs is so rare that an opportunity to examine it closely is quite worth pursuing. Our contribution to the evaluation of this program would be our time, expertise, and travel, and we would get the benefit of the time, expertise, and data of the AED group. The potential for some cooperation of this kind is currently being discussed with AED.

The Manoff Projects in Nicaragua and the Philippines

Manoff, Inc., NY-based advertising firm, has been operating under an AID contract to conduct pilot studies in the use of radio for nutrition information. We are currently engaged with AID Office of Nutrition to determine if there is an appropriate role for EDUTEL Communications and Development, Inc. personnel in an analysis of cost-effectiveness and cost-benefit information of this project.

Philippines

In 1976, the Ministry of Education in the Philippines undertook a one-year comprehensive planning study of the possible applications of communication technology to education. In the course of this study they identified a number of priority educational needs that could be addressed via media. This analysis is serving as the basis for a pre-investment study for the World Bank. The principal applications being

considered are agricultural training including both farmer leaders and agricultural extension workers, and teacher training. Additional direct student instruction in mathematics is being proposed on a pilot basis.

In view of the fact that EDUTEL has been involved in this planning activity and because of the likelihood of World Bank finance, we feel that the Philippine COMTECH project, if it goes forward, should be one of our case studies.

INDONESIA

There are a number of interesting specific opportunities, as well as broad underlying justifications to cause us to recommend Indonesia for a cost-effectiveness case study. Two visits to Indonesia in the past six months as well as continuing correspondence with a number of Indonesians active in educational technology leads us to believe that the following subject areas would provide a sound basis for an Indonesian case study:

1. The current teacher training via radio project of Ministry of Education Planning Office (BP₃K) is being considered for expansion over the RRI satellite radio network. A cost-effectiveness study would make this a better informed decision. The USAID mission has also identified this project as worthwhile (Carbin letter of April 19, 1977).
2. A television component of in-service teacher training is being developed by BP₃K. USAID and others are assisting with the training of production and utilization personnel. In view of the powerful outreach of

the new Indonesian TVRI distribution system, we feel it would be useful to introduce a system of resource accounting into the early stages of this project to assist formative evaluation of the day-to-day project decision and to provide the organized data base for a subsequent overall evaluation.

3. A group of three smaller educational technology evaluations has been suggested by the mission: Project PAMONG, secondary school instructional modules, and a sub-portion of the large education finance project dealing with benefit outcomes. These activities need to be more accurately assessed and specific study proposals prepared where appropriate. Such a task could easily be undertaken in conjunction with either (1) or (2), above.

Paraguay

The Rural Radio Education project was begun in January 1977. It is aimed at providing complete primary schools in rural areas by using radio. The project is AID-supported and both technical assistance and evaluation are being provided by AED. EDUTEL personnel discussed some concepts that might be employed in a case study with Paraguayan officials, Jon Gant in the local AID mission, and with AED personnel. EDUTEL has proposed to perform a cost study answering the interests of those groups and aimed at developing more useful cost analysis methods.

Tanzania

Tanzania has a long and interesting history of efforts to use mass media in various aspects of health, nutrition and farmer education. Discussions have been pursued with Dr. T. Luta Malijamkono, an economist working in the area of educational sector analysis at the University of Dar-Es-Salaam, as to the possibility of undertaking a relatively low-cost survey of the specifics of either one small project or the general economics of Tanzania's overall approach to educational technology. Dr. Malijamkono met with both Wilbur Waffle and Steven Klees while he was visiting the United States (with regard to another project). The exact nature of this case study will be developed by Dr. Malijamkono upon his further review and assessment of the current situation in Tanzania. If his findings are favorable, EDUTEL would like to include Tanzania in its list of recommended case studies because of the geographic and political diversity that such a study would add to our overall effort.

III. PLANNED SECOND YEAR ACTIVITIES -- JULY, 1977 -- JULY, 1978

A primary activity for the second year of the contract will be the addition to the cost-effectiveness/cost-benefit analysis state-of-the-art examination (in terms of looking specifically at applications to non-formal agriculture and health education utilizations) and the translation of the work in this field to manual form, directed towards non-economists. There has been some discussion about the possibility of working on this manual with one or two professionals hired by UNESCO as part of a larger cooperative enterprise, and such a possibility will be examined more closely this summer.

The second major area to be pursued during this contract year will be additions to the case studies. The study of the benefits accruing to ETV in El Salvador will definitely be completed. Some work on the BVE project in Guatemala, the Manoff project in Nicaragua and/or the Philippines and media education efforts in Tanzania seem possible. These could be low cost efforts, under existing contract funds, that concentrate on beginning to fill in our significant lack of literature on the economics of non-formal educational systems. The potential also exists for interesting case study work in the Philippines, Paraguay, Afghanistan, Indonesia, and again, Nicaragua (on the effectiveness side of the Radio Mathematics Project). Work on these projects would likely require additional funding and some alternative possibilities are being discussed.

Clearly, such efforts should reflect the work and plan of the Harvard and ETS contractors, and we feel we should make every effort to at least all overlap in one country. Furthermore, it will be useful to integrate our work with the few others who are specifically examining the economic

of educational media. Toward this end we have been recently discussing possible cooperative ventures with the World Bank in the area of distance learning systems and with IREDU (France' nutritional economics of education research center who have done substantial work for UNESCO in this area).

Finally, part of our activities in the field involve disseminating information. With more products completed as a result of this first year of activities, greater dissemination efforts will be appropriate. Nonetheless, such efforts are, in our opinion, inadequately funded in the current contract. This stems largely from the fact that effective dissemination almost always involves a period of fairly intensive personal interaction with local decision makers, which implies high travel costs. This may not be a significant problem, as dissemination activities will best be carried out after the second year of work.

In our opinion, we have made rapid progress this year, and this contract, through various mechanisms, has acted as a needed stimulus to a new field of research. We think UNESCO's idea of bringing together economists with decision-makers during the spring of 1978 is a sound one and that, as was done this year, such efforts should be undertaken as a cooperative enterprise with significant USAID involvement (providing arrangements to be discussed in early July are satisfactory). Such a conference would be a natural forum for displaying, discussing, and actually utilizing the two years of effort that will have gone into this contract by that time. Substantial dissemination activities and ideas for future research and development efforts could be expected to grow out of these deliberations.

IV. BUDGET FOR PHASE II

| Category | Original 2 Year Budget | Original 1st year | 1st Year Amended | 2nd Year Original |
|--------------------|---------------------------|----------------------|---------------------|----------------------|
| Salaries | 86,000 | 43,600 | 5,000 | 42,400 |
| Fringe Benefits | 18,000 | 9,000 | 1,300 | 9,000 |
| Consultants | 13,000 | 6,400 | - | 6,600 |
| Tvl. & Transp. | 29,000 | 11,500 | 9,000 | 17,500 |
| Other Direct Costs | 15,000 | 7,500 | - | 7,500 |
| G & A | <u>37,000</u> | <u>18,500</u> | <u>2,600</u> | <u>18,500</u> |
| Sub total | 198,000 | 96,500 | 17,900 | 101,500 |
| Fixed Fee | <u>13,500</u> | <u>6,900</u> | <u>1,000</u> | <u>6,600</u> |
| TOTAL | 211,500 | 103,400 | +18,900 | 108,100 |