



Education research priorities:

a collective view

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Abstract

Participants at meetings held in North America, Asia, and Africa on education research priorities, have assessed the current state of research in developing countries. Emphasis is placed on creative directions that research could take now to provide better education to more people despite minimal resources, by involving policymakers in the research process and by aligning research more closely with local conditions and needs.

Résumé

Évaluation de l'état de la recherche dans le domaine de l'éducation dans les pays en voie de développement. Cette évaluation a été faite par les participants aux diverses réunions qui se sont tenues en Amérique du nord, en Asie, et en Afrique sur les priorités de la recherche. L'accent porte surtout sur l'orientation à donner à la recherche pour assurer une meilleure éducation à une population croissante, malgré une sérieuse pénurie de ressources. On y trouvera deux recommandations: faire participer aux travaux les administrateurs au sein des écoles et du gouvernement, et adapter la recherche aux conditions et aux nécessités locales.

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Preface

This report was prepared by the International Development Research Centre as part of the broader effort of the Bellagio Consortium on Education to examine assistance to education. This effort was stimulated by the concern of many educators about the critical problems of providing more relevant education more efficiently to larger numbers of people despite severe resource constraints. The report aims to establish the nature and value of additional research in seeking solutions to these problems by considering whether more knowledge is required to evaluate the assumptions implicit in alternatives now being suggested and whether other solutions to current problems are possible.

The donor agencies of the Bellagio Consortium recognize that their contribution to education is small compared to the total investments in education being made by national governments. How then can this contribution be best used in conjunction with local government funding? Although it is evident that education development and planning will continue, research and evaluation on policy issues may help planners allocate scarce resources more effectively. Thus, there is a need to identify some important areas of research while recognizing that research is neither a precondition for all educational improvements, nor a panacea for all educational problems.

In undertaking this task, IDRC received cooperation from other agencies and from many experienced education researchers and policymakers from around the world. This cooperation was made possible primarily through a series of meetings held between September 1974 and January 1975 in Ottawa, Thailand, and Kenya. IDRC also benefited from close cooperation with the Ford Foundation, which sponsored regional meetings of researchers in Buenos Aires, Abidjan, and Lagos. These meetings provided the opportunity for a sounding of articulate and experienced people, which served as the basis for discussion and elaboration of the role of research.

A list of key research issues emerged from these discussions. However, it is not intended to serve as a list of ordered priorities to which *all* the efforts of education research in developing countries should be directed in the coming years. Rather, this list, in conjunction with a consideration of current educational problems and the applicability of research, suggests there is a need for additional support to education research.

IDRC would like to express its appreciation for the contributions that many individuals from around the world have so graciously made to this effort. Much time was unselfishly given in attending meetings, in discussing the issues, and in commenting upon the preliminary draft of this report. Although the report is an attempt to reflect the collective wisdom of those who have so kindly cooperated in its production, IDRC assumes all responsibility for any shortcomings.

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Research Dimensions

However rigidly “research” is generally defined, it became clear during the course of these investigations that the term should be broadly defined to include any activities that lead to a better understanding of education problems and that produce findings relevant to policy formulation and/or program planning. Research, then, includes any activity involving information-gathering and analysis from the simplest to the most sophisticated operation. Pupils, teachers, and local education officers can be considered as researchers and research users.

Our focus is on research whose results are likely to be valuable to decision-makers. This does not mean research gathered only in response to current government concerns, although research with limited applicability is known to receive little attention. Further, it is important to have the decision-makers themselves involved in the research process to ensure that the research relates to issues of importance to them and that the research results will be applied. Decision-makers could define policy issues that require research, participate in the administration and operation of the research project, and/or help in the interpretation of results.

The following are types of research that could be helpful to decision-makers:

- a) census and other data on the characteristics of education;
- b) studies of the operation of the existing education system;
- c) experiments with new measures for improving effectiveness, efficiency, and coverage.

The research process may be useful at any of the following steps of the problem-solving process:

- a) articulation of the existence or nature of a problem;
- b) gathering information;
- c) analysis — causes and implications;
- d) identification of possible solutions;
- e) experimentation and evaluation.

Is Research Being Used?

There is widespread agreement that in the past research often has not been useful for policymakers either because the research was unrelated to existing problems or because the results were presented poorly. Researchers would like to see their research used and would like support to do more, but on the other hand, policymakers have indicated that they can make no use of most of the research that is being done. It is clear that these conditions indicate either a weakness in the kinds of research being done, or a lack of interaction between policymakers and researchers.

There appears to be some explanation for the lack of research use in the past. In some countries, research in the field of education may be so recent and its tradition so young that it has had little time to affect policy. In other countries where research capacity is available, it has been concentrated in universities or research institutes that are often out of touch with government policy. Thus, research has too often been along narrow disciplinary lines reflecting the theoretical and urban-oriented interests of the academic environment. This lack of research focused on current policy issues has contributed to continuing limited budgetary support for education research, which in turn

has created little incentive to shift the focus of education research to policy-oriented issues, or to develop the machinery for coordinating the interests and activities of users and producers of research.

Despite these problems affecting the use of research, there is a growing demand by policymakers for research — a trend evident at the regional workshops. The policymakers do not always speak in terms of research needs but rather in terms of information needs to solve specific problems. We have learned of education reform committees urgently requesting specific research efforts, of some countries anxious to get new programs evaluated, and of others seeking the best approach to establishing research councils and research institutes. The recent increase in demand for research may be explained by:

- a) the view that education problems have never been more serious or extensive than today, with rapidly rising costs, diminishing national resources per student, and unequal access to educational opportunities;
- b) more intense public criticism of educational institutions coupled with appeals for reform and an increasing demand by the public for greater involvement in planning and management;
- c) a growing recognition that suitable and reliable data and policy options are scarce or nonexistent.

To be sure, there is much that is already known about education that, if applied, could result in immediate improvements (such as providing textbooks for children who do not have them), but much remains that is unknown. In the face of recent assertions that schools have failed and that various combinations of basic education, nonformal education, and educational technology can provide dramatic breakthroughs, it is particularly important to ask what evidence is available to back up these assertions and to evaluate pilot programs. In the absence of empirical data and analysis, policy and program choices will likely be guided by present conventional wisdom, intuition, or personal interest.

Nevertheless, it is important to maintain some perspective on the utility of research, since its application will always be limited by the practical realities of decision-making. Administrative decisions must be made within certain time limits and often cannot wait for reliable research data to become available. Also, given the current state of theory, methods, and available resources, it is unrealistic to assume that research will provide conclusive answers to many important policy questions. However, the steady accumulation of information can lead to improvements in educational effectiveness and efficiency.

Problems of Education in Developing Countries

There is a large and, in most countries, growing demand for education; governments are trying to meet this demand despite severe resource constraints. Our assumption is that the demand for at least some kind of minimal education will be a crucial issue for some years to come. Regardless of the strategy a particular country chooses, it is crucial to find ways of educating more people to a minimum acceptable standard, despite the limited resources. There is some evidence that governments are beginning to put increasing emphasis on educating primary school-age children and rural peoples, and these groups have emerged, during our discussions, as the most important focus for our study. This focus should not imply, however, that the research might not often be as valid for educational programs designed for other groups.

Primary school children are by far the largest group, and they take the largest proportion of the educational budget in virtually all developing countries. Still, they often leave primary school without one of the most essential educational skills: literacy. Most children will have no further formal education after they leave primary school. People without primary education are excluded from many options in later life. Thus, problems related to the effectiveness, efficiency, and coverage of education for primary school-age children need study urgently.

Given the large percentage of the population that lives in rural areas, an increase in agricultural yield and in farmer welfare are essential factors in improving rates of economic growth, facilitating development, and affecting income distribution in many countries. More needs to be known about the educational needs of the rural population and the type of learning systems that will affect the welfare of these people.

The issues that affect policy formulation can be organized into six categories:

- (1) Learning efficiency;
- (2) Education and employment;
- (3) Imbalances in education opportunities;
- (4) Planning, management, and administration;
- (5) Cost and finance;
- (6) Evaluation.

There has not been an attempt to determine an order of priority among these categories, but within each category those research issues that appear most important have been indicated. In considering research issues, the following questions, which reflect the concerns of both the producers and consumers of research, should be kept in mind:

- a) Is the issue of general importance across national boundaries?
- b) Is there a need for more data?
- c) Is it realistic to expect that additional research, given the available methods, will lead to new levels of understanding that will contribute to the definition of realistic policy options?
- d) Can the desired results be obtained within a reasonable time period and at a reasonable cost?
- e) Is the issue related to a relatively large budget expenditure and, therefore, could the results lead to a significant improvement in resource allocations?

Issues

(1) Learning Efficiency

Fundamental questions related to the nature and relevance of learning theories in different countries may, in the long run, provide the basis for significant shifts in educational practices. Keeping this in mind and recognizing that students' abilities and motivation are significant determinants of learning efficiency, it would appear that there are still other factors independent of the educational system that could be altered to advantage.

In approaching the subject of how to improve learning, the following questions provide a focus: To what extent do educational systems have unrealistic objectives, neglected needs, irrelevant curriculum, or a lack of congruence between local needs and stated national priorities? What are the key social, economic, and political problems and can these problems be improved by increased knowledge and skill, or are other elements critical in their solution? To what extent are existing rural education programs ineffective because of widespread economic or social conditions which no amount of knowledge of local conditions could alter? What kind of educational needs are expressed by peoples' motivation toward, and the demands they make on, available educational programs?

Given well-articulated objectives, what kinds of educational programs can realistically be expected to meet these objectives? Within specific programs, what inputs, in both content and instructional methods, can be altered to most effectively achieve the desired output? What is the impact of various schooling inputs such as the number of pupils per teacher, qualifications of teachers, and availability of textbooks? What is the contribution to cognitive growth of expensive technologies, such as different media and individualized instruction, that are being experimented with in a number of countries? Are there factors outside of the education system such as health and nutrition, that critically affect learning outcomes and where additional investments would have a

higher payoff than in the education system itself? Finally, to what extent are knowledge and skills retained from programs in primary schools, and to what extent are these skills lost or never applied?

Possible Areas of Research

- a) The development, evaluation, and application of methods to *identify* minimum skill requirements such as reading, writing, arithmetic, and basic knowledge of the environment.
- b) Experiments with the most cost-effective methods of providing those skills such as reading, writing, and arithmetic, which are considered basic requirements.
- c) The development, evaluation, and application of methods to identify attitudes that the society values and the extent to which they can or should be transmitted or reinforced by the school system.
- d) The development of studies prior to implementing education programs to identify the skills and knowledge that can be utilized by rural people within existing economic and social constraints.
- e) Studies of the impact of some conventional schooling inputs — teacher qualifications and training, class size, school architecture, media — on the quality and efficiency of education. In particular, can the period of teacher training be reduced without affecting teaching quality or pupil learning?
- f) Studies of nonschool determinants of learning, such as nutrition and health, that can be influenced by policy. This type of study might find, for example, if there are trade-offs between free lunches and higher level teacher training.
- g) Experiments with the use of the vernacular as the medium of instruction in the early years of primary schooling with a view to improving pupils' long-term school performance.
- h) Studies to determine why students leave school before completing the primary cycle; what they do after leaving; what they gain from school; and to what extent literacy, knowledge, and skills are lost when primary school pupils leave the school system.

(2) Education and Employment

The interrelationships between an educational system and employment patterns are complex. Although these relationships are not well understood, there is a desire to make the educational system as responsive as possible to the needs of the society. A major problem in improving this relationship appears to be not in assessing the skilled manpower needs but in understanding better both the types of attitudes, skills, and knowledge useful to a wide range of occupations and the most efficient way of transferring specific skills.

Possible Areas of Research

- a) Studies of core knowledge, skills, and attitudes useful to a wide range of occupations, that schools could provide. In particular, what are the skills and attitudes valuable for a life of productive self-employment (whether in farming, commerce, or craft industry) and how are these best developed?
- b) Since there is little evidence that high-cost training schemes are necessarily effective, there is a need for experimentation with and evaluation of alternative vocational training schemes such as apprenticeship, informal on-the-job learning, and programs managed by industry and government and financed by employers and employees.
- c) Studies of the employment history of past graduates to improve the understanding of training needs and how training is acquired and utilized.

(3) Imbalances in the Distribution and Quality of Educational Opportunities

It is recognized that equal educational opportunity is not an easily attainable goal. However, in view of the important role of schooling in determining life's options, and

a growing concern about imbalances in income distribution, authorities in many countries are seeking to redress disparities in educational opportunities. Data about the precise nature of these disparities are scarce, and as a consequence, policymakers have little evidence on which to base policy decisions.

Possible Areas of Research

- a) Improvements in the routine collection of data, such as current and projected demand for schooling and quality of schooling (availability of textbooks, qualification level of teachers, pupil/teacher ratios); detailed studies of the procedure for determining the size and distribution of allocations for school development as they relate to the performance of pupils, in terms of their region, sex, ethnic group, etc.
- b) The design and implementation of the most cost-effective means of redressing these imbalances, such as special programs or new financing formulae.

(4) Educational Planning, Management, and Administration

Although planners and administrators are extremely influential in determining the structure and function of educational systems, there has been little analysis of how they can perform their jobs more effectively. To identify the critical issues on which research may be helpful, the management process can be considered in terms of: (a) policy formulation; (b) planning; (c) administration; (d) personnel and staff development; and (e) evaluation.

Possible Areas of Research

- a) *Policy formulation.* What effect do local demands have on national plans and resource allocation? What is the role of the educational establishment in encouraging or impeding educational reforms? How is research commissioned and used?
- b) *Management information systems.* What record-keeping systems can be developed to help in the collection and utilization of basic data on the system? How can manuals and procedural guidelines be developed to assist headmasters and inspectors in carrying out routine tasks?
- c) *Decentralization.* As systems grow more complex, what functions can best be performed at the local, district, or provincial levels, and which in the central ministry? What factors inhibit effective communication upward from local communities and downward from national policymakers?
- d) *Personnel development.* What are the characteristics of effective teachers and administrators? What kinds of training programs, what combination of pre-service, in-service, correspondence courses, workshops, etc. develop desirable characteristics most effectively and efficiently? What are the incentives that attract teachers and administrators into the field and affect morale? To what extent is the quality and training of the head teacher a key factor in the success of the primary school?
- e) *Dissemination and replication of innovation.* How do individual educational innovations tend to spread? How can successful "pilot" programs be tested for their transferability to other locations, and replicated on a large scale?

(5) Cost and Finance

The issue of cost is related to the totality of education. Real costs per student are rising rapidly. Substantial additional resources are not likely to be made available for education even though it is needed to make education more widely accessible. The structure of educational costs and the method of financing have an important effect on educational coverage. Thus, policymakers are actively seeking alternative means of educational financing and opportunities for reducing costs.

Possible Areas of Research

- a) *Cost studies.* Coarse indicators of comparative costs of various educational

programs can help the decision-maker in the process of allocating resources more efficiently to institutions and programs. Studies of “unit” (per pupil) costs in conjunction with experiments that analyze the effect of various inputs on the desired output of the educational program could indicate potential savings within institutions. For example, can school buildings be used more intensively through double shifts or teachers more intensively by increasing class size without reducing output? Are guides for teachers a more effective use of paper than textbooks? Are additional expenditures on in-service training programs after schooling a more cost-effective use of resources than the provision of more textbooks during schooling? Can detailed cost-effectiveness studies of various forms of higher education, which often have unit costs many times that of primary school, reveal potential savings that could be transferred to lower levels of the educational system?

b) *Finance studies*

i) Studies that analyze who is currently paying for different levels of education compared with who benefits by receiving the education can help reveal the nature and effects of inequalities and the extent to which public expenditure is subsidizing students from high-income families at the expense of poorer students. A number of such studies have already been undertaken, but more are needed to complete the picture.

ii) The identification, implementation, and analysis of alternative sources of financing, such as local financing for preuniversity education, or student loan programs for university education, could suggest a more equitable distribution of existing resources.

(6) Evaluation

In recent years, a number of new programs have been introduced in developing countries with a view to improving the quality and coverage of education — nonformal adult programs, educational radio and television, programmed instruction, and alternative types of vocational training. Often large investments are made to expand these programs without a thorough assessment of their effectiveness, efficiency, and replicability. Without evaluative data, there is a danger that resources will be wasted. Education authorities are also seeking reliable methods to measure pupil progress, diagnose learning problems, and select pupils for higher levels of schooling.

Possible Areas of Research

- a) The design of reliable and low-cost literacy tests and standardized achievement tests, including reliable and valid tests for minority groups. Tests that the classroom teacher can both administer and analyze could be particularly useful.
- b) Although specific program evaluations (for example, of educational technologies, nonformal education programs, and vocational training) may suffer from difficulties associated with measuring relevant learner outcomes (particularly behavioural changes) and attributing these outcomes to the education program as opposed to other influences, the results can be sufficiently reliable to indicate overall program worth, costs, implementation problems, and possible improvements.
- c) Evaluation of methods to improve teacher training and teacher supervision.

Implications for Donors

(1) Education Research Capacity

Concern is being expressed about deficiencies in research capacity in the field of education regarding utilizing existing capacity better as well as adding to the existing capacity. (Capacity, in this context, includes not only the knowledge and skills required to undertake research but also local rewards or incentives, budgets, and organizational machinery.) Many agencies have devoted considerable resources to building both institutional and human capacity to undertake research in the field of education, and continue to do so. Thus, this concern with the need to increase research capacity is receiving significant attention. Any review of capacity and the need to increase it should involve more than an analysis of the research skills needed or of the most effective means of developing these skills. The review should assess issues such as strategies for mobilizing institutional structures and research personnel and the development of functional linkages between researchers and policy-makers.

There are many types of levels of research skills required: managerial skills, data-collection skills, instrument-design skills, data-processing skills, analytical skills, substantive area skills, and communication skills. Thus, it is likely that some research capacity at some level exists in most countries. The need is to clearly determine the requirements and the best kind of training, and whether short nondegree or on-the-job training programs satisfy these needs. It is important to keep in mind that building or expanding an education research program will involve planning, organizing, and financing research as well as training researchers.

Strategies for mobilizing existing research capacity are also important. In many countries an untapped capacity of trained researchers exists that could be utilized for education research. These researchers, with a variety of social science training, work in universities, in the educational establishment, and in government ministries. Although they have not in the past done research in the field of education, if the funds were available and if the structures of local research institutions would allow it, existing capacity could be utilized.

Any discussion of capacity also raises questions about the relationship between national, regional, and international capability. The methods of investigation and solutions to some problems appear to have general applicability. Countries undertaking research to assess the applicability of earlier research to their own environment, will benefit from access to details of established methodologies and results. Thus, considering the nature of research problems in education and the great variety in research capacities, it will be necessary to capitalize on the capabilities and resources of the educational community at all levels: international, regional, and local.

(2) State-of-the-art Reviews

For many of the research areas identified, some detailed review of the literature is necessary before further investment in research is made. This could:

- a) summarize what is known about the subject;
- b) identify those problem areas that have been adequately researched but where little analysis and/or dissemination of results has taken place;
- c) assess the validity and utility of the accumulated knowledge;
- d) indicate whether research, completed or underway, points to particularly productive leads;
- e) identify significant knowledge gaps;

- f) systematize the descriptions of, and assess the validity of, available methodology.

(Appendix A provides an example of an initial assessment of a research area outlining the need for, and nature of, a detailed review. Appendix B provides an example of a possible format for a detailed review.) As many as 20 such reviews might be considered initially. It is hoped that several of these would be completed as soon as possible since we are arguing strongly to consolidate the existing information before embarking on new data-gathering ventures.

Detailed reviews would also permit a preliminary classification of the following research areas:

- a) Areas where extensive work has already been done and the main need is to analyze the material, present the findings in a form useful to policymakers, and disseminate the results.
- b) Areas that may have already produced some useful results but where additional research must be undertaken. (Appendix C, which outlines *A Study of Primary School Efficiency* just being completed by the National Education Commission in Thailand, is an example of a project in this area. It is also an example of a study that can be completed in a short period of time, at a low cost, with a variety of researchers, and with the involvement of administrators and policymakers at all stages.)
- c) Areas that are important but where little or no research has yet been done, and where there is a need to begin some initial exploration.
- d) Pilot projects designed to test alternative approaches under conditions of careful evaluation may develop out of any of the above research areas. (Appendix D, which outlines the efforts of Southeast Asian Ministers of Education Organization to develop an alternative delivery system for the primary schools of Southeast Asia, is an example of such a pilot project.)

Such a preliminary classification would allow an estimation to be done of a reasonable level of additional investment for educational research over the next 5 years. However, research in education, in its various guises, has a long history. There are many areas in education where both research and experimentation have been carried on for many years. Before recommending additional investment either for further research or action programs, it would seem important to learn what we can from available information. For this to be done systematically, we would recommend some form of research coordination. This would ensure that donor agencies and developing countries have access to information about significant past and current research related to education in the developing countries.

A principal implication of this initial process of identifying key issues that require further research is that the process should be a continuous one. Consideration should be given to creating a means whereby the efforts in the field of education research could be continuously guided by an ongoing assessment of past and present activities and given an indication of important areas for further research. Such a process would serve the interests of the developing countries, the donor agencies, researchers, planners, and decision-makers in promoting more effective policy research.

Epilogue

The research areas outlined in this report were presented as an interim report to officials of the donor agencies meeting in Geneva in February 1975. Some of the participants in the Ottawa, Thailand, and Kenya meetings were also present at the discussions. At that time, IDRC was asked to prepare a presentation for Bellagio III that would: a) make a case for additional resources for education research over a significant period of time, and b) suggest a mechanism for gathering and disseminating information useful in planning and implementing an increased effort in the field of education research.

IDRC prepared a final report that included a recommendation for the establishment of a mechanism to assist in the orderly flow of resources to critical areas in education research. It was suggested that such a mechanism might consist of a research advisory group of 15 members from both developed and developing countries of researchers, planners, and decision makers. The members would be chosen on the basis of their own professional competence and not as representatives of countries or agencies. The research advisory group would identify research priorities of importance to more than one developing country, commission state-of-the-art reviews, identify areas requiring further research, assist when requested in designing or evaluating research programs, assess national and regional research capacities, and advise on the progress and direction of the research effort as a whole. A small secretariat of two or three persons would be established to support the research advisory group.

The Bellagio III meeting was postponed from the summer of 1975 to 1976. However, in December of 1975 representatives of many of the donor agencies involved in the Bellagio Consortium expressed support for the concept of establishing a mechanism for the purposes described, and discussions are continuing. In the interim, and until such time as joint action is undertaken, IDRC will strive to maintain the momentum that was generated during the earlier stages.

Appendix A
Notes on the Experience from Selected Literacy Projects
and the Implications for Future Research and Experimentation
J. Roby Kidd

We solicited brief statements, from people throughout the world, related to research areas listed in the report in which they have experience and interest. These statements could serve as the basis for making decisions about the future state-of-the-art reviews. The following is an example of one such statement.

1.0. *By literacy, we mean the following kinds of programs:*

- 1.1. Programs developed in 11 countries under the sponsorship of UNESCO-UNDP in the World Experimental Functional Literacy Program.
- 1.2. Programs generated in the same fashion as above in an additional 14 countries.
- 1.3. Some national programs of literacy based on other methods than 1.1. above, notably:
 - 1.3.1. The national literacy program of Japan
 - 1.3.2. The national literacy campaign in Cuba
 - 1.3.3. The national literacy in Burma
 - 1.3.4. The work of MOBREAL in Brazil
- 1.4. Programs in Canada and the United States — particularly the latter — that come under the label: Adult Basic Education or ABE.
- 1.5. Some miscellaneous programs founded on different premises but with considerable promise, such as:
 - 1.5.1. Projects based on the methods of Paulo Freire in Peru, Bolivia, and Botswana
 - 1.5.2. The ICECU project in Central America
- 1.6. Some programs under the rubrics of rural development or health education developed in various countries that have similar goals and are examples of basic education:
 - 1.6.1. The village polytechnics in Kenya
 - 1.6.2. The health campaign in Tanzania
 - 1.6.3. The village labour education programs of ILO near Poona.

2.0. *Significance*

- 2.1. There was never a time in history when there were so many comparable programs of basic education for youth and adults. Pursuing roughly equivalent goals, the organizers of these programs applied different philosophies, methodologies, and organization plans. The total number of students reached, at least in some fashion, even on a conservative count, totals 40 million (e.g., MOBREAL enrolls 6 million).
- 2.2. For the first time, there is a body of experience that can be tapped that can provide a great deal of information about organization, methodology, styles of learning as well as some cost comparisons.

3.0. *Present stage of evaluation*

- 3.1. Although the varieties of programs and the scope and significance of this work have been noted, it is sadly true that the data available about these programs are of varying quantity, and quality ranges from zero to fair, with only a few examples of notable evaluation enterprises.
- 3.2. Because of the uneven quality and the sheer volume of the data, thorough and systematic investigation may take several years to complete.
- 3.3. However, some work of evaluation has been done with respect to 1.1, 1.2, 1.3.1, 1.3.3, 1.4, and 1.5.2.

- 3.4. It is possible to mount a project that will extract a considerable body of practical experience in a probe extending only for a few months as well as suggest the more extensive and systematic kinds of research that might follow.
- 4.0. *What kinds of application?*
 - 4.1. From a perusal of some of these data, we conclude that applications may be useful for some or all of the following:
 - 4.1.1. Application to primary school systems
 - 4.1.2. Application to training programs for primary school teachers
 - 4.1.3. Application to planners of integrated programs of education, health, nutrition, family planning, etc.
 - 4.1.4. Application for national and regional educational planners.
 - 4.2. The problems to which the data speak authoritatively include social indicators that may be used for estimating success, difficulties in developing goals for basic education, difficulties of bringing coherence where several government departments are involved, difficulties of relating national goals to regional administration, difficulties of bringing about change and innovation in ministries, as well as pedagogical problems of many kinds including new data about teaching *numeracy*. There are examples of cost benefit analysis and changes measured in relation to behavioural objectives.
 - 4.3. It is now much easier to undertake a statement of minimum goals of basic education for most countries.
- 5.0. *Because of the significance of the World Experimental Functional Literacy Project, it is worth outlining the work of the UNESCO-UNDP commission in evaluating it:*
 - 5.1. Four kinds of material will be available from this project:
 - 5.1.1. Evaluations by study teams of the 11 projects. In the case of Iran, the evaluation is substantial and extremely valuable; in the case of Tanzania and some other countries, it is small but useful; in the case of some countries, little data is available. (In draft now)
 - 5.1.2. Technical papers prepared by the UNESCO Secretariat. These number nine, and they are an interesting and valuable collection of papers derived from some analysis of the country evaluations. They are, in the main, descriptive/analytical — there are no recommendations. (In draft now)
 - 5.1.3. The Commission will prepare a 100-150-page report designed for officials and others that make educational decisions based on these documents. The report will deal with urgent matters and high priorities: it will not attempt to be comprehensive. It will be a useful document, but it must be remembered that it is based only on the 11 projects.
 - 5.1.4. Although these documents will be useful, it is also necessary to sample other and wider experience available in the other projects noted in 1.
- 6.0.
 - 6.1. Because of the urgency of the matter, and because of the potential importance of the observations and conclusions that may be extracted from these sources, it would be useful to extract quickly, within 4 months, practical, relevant, and significant experiences, results, and recommendations from all of these sources.

Appendix B

The Determinants of School Achievement in Developing Countries: The Educational Production Function

Leigh Alexander and John Simmons

International Bank for Reconstruction and Development, Staff Working Paper no. 201,
March 1975.

This paper provides one example of the type of state-of-the-art review that might be commissioned. The subject of this particular paper might not be considered as high priority to a future research advisory group, but it provides a useful example of how a review might be approached. It includes a comprehensive description of the existing methodology, a summary of the findings of available studies, and an analysis of these findings. It is not reproduced here since it is available from the International Bank for Reconstruction and Development, Washington, D.C.

Appendix C

A Study of Primary School Efficiency

National Education Commission, Thailand

Introduction

In July 1972, the Executive Committee of the National Education Council endorsed a recommendation put forward by the NEC secretariat for a study of the efficiency of primary schooling. This paper suggests the broad outlines of such a study. Its purpose is to provoke comments and suggestions that would be helpful in completing a research design.

The Problem

Planning the development of primary education requires valid and reliable information about the costs and effectiveness of primary schooling. We need to know: 1) what primary schooling is expected to produce; 2) what primary schooling actually produces; 3) how it produces, what is the contribution of different ingredients (teachers, visual aids, etc.); and 4) the costs of production. Unhappily, however, not much information of this nature is available in Thailand. We know little about the range of skills and knowledge that primary schooling produces or the extent to which the same are retained. Even less is known about how variations in teacher qualifications and characteristics, abilities of headmasters, socioeconomic environments, and school facilities influence pupil performance in school. It is not very clear why some pupils succeed while others fail, repeat, and drop out. We are not sure whether teachers with a Paw Kaw Saw Soong produce better educated pupils than teachers with lesser qualifications, or whether pupil/teacher ratios of 35 to 1 are really a necessary standard, or what teacher characteristics are required to help Thai children learn in different environmental settings. Cost data is also scarce. Aggregate estimates suggest wide ranges of per primary pupil expenditure, but it is not known precisely why these variations occur or whether they affect school performance.

Without reliable information on the costs and effectiveness of the schooling process, plans for developing primary education can be based only on hunch and intuition, conventional practice

and imported education models that may not be appropriate in Thai circumstances. It is clearly imperative to learn more about how primary schools function and what they accomplish. First, the size of primary education is enormous in human and financial terms. Education in Thailand quite literally means primary schooling — nearly 90% of pupils in all levels and types of education are enrolled in primary schools; moreover, this level consumes approximately 60% of the country's education budget or approximately 12% of total public expenditure for all government sponsored activities. Therefore inefficiencies at this level are likely to be costly in absolute terms. Second, primary schooling is the only formal education most children receive since many drop out or cannot find school places after completing grade 4. Given the government's commitment to basic mass primary education, the effectiveness of the first 4–7 years of schooling is therefore crucial. Third, the incidence of wastage (drop out and repetition) is high. It is estimated that 10% (about 300 million Baht) is spent each year to educate repeaters in primary grades. To what extent are these phenomena caused by school factors (as opposed to socioeconomic factors) that might be controlled by policy decisions? Fourth, projections of current growth trends indicate that primary school expenditures could reach intolerably high levels within the decade. For all these reasons, it is essential to learn more about how primary schools function and what they achieve.

General Purpose of the Study

The objectives of the study are to: 1) show how schools vary in facilities and performance in different parts of the country; 2) see whether variations in school facilities and nonschool factors are related to pupil performance and identify with more clarity some of the factors that contribute to repetition; and 3) obtain reliable cost data on various factors of primary schooling and identify differences in per pupil expenditure by geographic region and administering authority. The purpose of the study therefore is to provide to planners and administrators information that might help guide them in preparing plans for improving primary school efficiency and equalizing educational opportunities.

Some Specific Questions

The following are examples of specific questions the study will investigate:

- 1) Whether primary school teachers' knowledge and skills (as measured by a performance test) are related to levels of qualification; that is, whether teachers with higher certificates possess more knowledge and skill.
- 2) Whether there is a relationship between pupil performance and teacher qualification; that is, whether more highly qualified teachers seem to produce better pupils.
- 3) Whether certain characteristics of teachers — verbal abilities, attitudes, subject knowledge — are significantly related to pupil performance.
- 4) The extent to which home environment, including education of parents, influences school performance.
- 5) The relationship of per pupil expenditure and scholastic achievement.
- 6) The degree of association between pupil performance and such variables as class size, pupil-teacher ratios, distance of school from home, and availability of different instructional materials.
- 7) Whether the use of central Thai as the medium of instruction in parts of the country in which pupils are not exposed to central Thai in their households is related to school achievement.
- 8) Differences in achievement between P-3 and P-4 pupils.
- 9) Differences in performance between repeaters and nonrepeaters. We might be particularly interested in pupils who repeated P-1. Do they do better or worse than other pupils? It may be that P-1 repetition functions as a form of preprimary schooling (most repeaters may be underage in P-1).

Methods

1. Variables

Performance: Standardized achievement tests will be used as an indicator of P-3 pupil performance. In addition, a scale might be designed to measure pupil attitudes toward schooling, different occupations, life in community, etc. Other measures of school performance might include promotion rates, etc.

Education factors: At present there is little theory about how different education factors affect scholastic achievement. Consequently our list of variables is derived largely from logical assumptions and correlates of performance found in other studies. The following are possibilities:

Possible Independent Variables that are Related to Pupil Performance

Teacher Characteristics

Variable	Measure
Sex	M, F
Age	Years
Teaching experience	Years
Teaching qualification	Certificate level
Teacher training institution	Name
Academic qualification	Level schooling completed
Absenteeism	Ratio
Teaching load	Hours, number classes
Exposure to in-service training	Weeks
Original dialect	Name
Whether living near school	Yes, No
Whether from region where school located	Yes, No
Verbal ability	Test
Attitude toward pupils	Scale
Whether studying in twilight course	Yes, No
Civil service position	Grade
Salary	Baht
Job satisfaction	Scale
Subject knowledge	Test
Reasoning, logic, fluency	Test
Administrative duties	Hours
Additional jobs	Hours
Headmaster	Yes, No

School Characteristics

Variable	Measure
Size	Total enrollment
Location	Inner city, city, district town, village
Quality of building	Scale
Classes	Number
Qualification of teachers	Qual./30 pupils
Teacher turnover	Ratio
Teacher absenteeism	Ratio
Crowdedness	Pupil/class ratio
Annual expenditure by category	Baht/pupil
Tenure of headmaster	Years
Attitudes of headmaster	Scale
Motivation of headmaster	Scale
Community contributions	% funds from community
Inspection	Times last 3 years
Qualification of headmaster	Level

Pupil Characteristics

Variable	Measure
Age	Years
Sex	M, F
Repeater	Yes, No
Repeated earlier grades	Yes, No, How many
Attendance	Days absent
Homework	Hours
Original dialect	Name
Previous school year performance	Class ranking if available
Enough textbooks	Yes, No, Number

Variable	Measure
Family size	Number
Motivation	Grade aspiration
Tenure in school	Years in other schools
Distance to school	Km
Conveyance to school	Type
Older sibling education	Mean years
Father's job	Scale
Mother's job	Scale
SES	Scale
Religion	
Pupil job; seasonal	Hours/week
Attitude of parents	Grade expectation for pupil
Scholastic achievement (beginning P-3 and end P-3)	Tests
Preprimary education	Years
Seat in classroom	
Height/weight relationship	Ratio

Classroom Characteristics

Variable	Measure
Crowdedness	Number pupils; sq m/pupil
Exposure to teacher	Pupil/teacher ratio
Extent repetition	% repeaters enrolled
Lighting	Scale
Availability of instructional materials	Scale based on key items

2. Sampling

The country would be divided into geographic areas (possibly Changwads or artificially designed districts). An area sampling fraction would then be applied to select a manageable number of districts for inclusion in the study. From each selected district a stratified probability sample of schools with P-3 classes would be selected, stratified by administering authority (DOLA, MOE, and municipalities), location (inner city, city, town, and village), and school size. The total number of P-3 classes selected would depend on the number of variables included in the study and the size of our research budget — a guess would be about 1000 P-3 classes and teachers, and 10000 pupils. We might consider also the inclusion of a purposive sample of private schools. Sampling fractions would be determined from MOI and MOE records.

The focus of the study will be on P-3. P-4 was considered but was rejected since there is less repetition at this level and furthermore an unusually large part of the school year and teacher effort is devoted to preparing pupils to pass the P-4 school leaving examination. Nevertheless a small sample of P-4 classes will be included to contrast P-3 and P-4 test results.

3. Research instruments

Standardized tests for P-3 and P-4, designed by the Department of Elementary and Adult Education, would be used as an indicator of pupil performance. Tests would be administered to pupils by teachers under the supervision of headmasters and supervisors, trained by the research team. Background information about pupils would be obtained from interviews or questionnaires also administered by school teachers and headmasters who would be guided by supervisors and members of the research teams.

Teacher characteristics would be measured by a "teacher performance test" coupled with questionnaires or interviews with members of the research team or trained supervisors. The "teacher performance test" would be a standardized achievement-aptitude test covering subject knowledge, verbal ability, reasoning, and other skills; in addition, an attitude scale might be constructed to probe attitudes in such areas as job satisfaction, pupil behaviour, curriculum, adequacy of school facilities and school administration. Depending on the geographic distribution of schools, the teacher test and scale would be administered by either trained headmasters and supervisors, or by members of the research team. Questionnaires would be used to obtain teacher background data, e.g., certificate level, years experience, etc.

Data on schools and classes, such as costs, enrollments, qualification structure of teaching force, teacher absenteeism, retention rates, etc., would be derived from interviews with headmasters by supervisors and members of the research team. Additional cost information might be obtained from MOE and MOI records.

4. *Statistical treatment*

Several statistical analyses will be employed including tabulations of frequencies and ranges, comparisons of means, correlations, and multivariate analyses based on multiple regression equations. Multiple regression equations "explain" variance in a dependent variable (in our case, performance) in terms of variations in independent variables (education factors); they indicate which factors are significantly associated with pupil performance levels and the strength of association.

Tentative Schedule

The study would consist of two phases over a 2-year period:

Phase one

Organization of administrative and advisory committees, and completion of research design	Nov-Dec
Begin construction of research instruments: adjustments of P-3, P-4 tests; teacher performance test; questionnaires and interview schedules for headmasters, teachers, pupils, and parents	Dec
Selection of sample	Jan
Completion of pretesting P-3 and P-4 tests; and questionnaires concerning costs and physical facilities	Mar
Training supervisors and research team members to administer P-3 and P-4 tests, and collect data on costs and physical facilities	Apr
Application of first test to P-3 and P-4 entrants, and collection of cost and space utilization data	May
Data processing and reporting results first phase	June-Aug

One of the main objectives of phase one is to give a test in May 1973 to pupils who have just entered P-3. It is assumed that this test will indicate the achievement levels that children bring with them to P-3. These scores will be one of our independent variables and will be included along with teacher characteristics, school physical facilities, etc.; in attempting to determine what variables are related to performance on the main test administered at the end of the P-3 academic year; in other words, it is necessary to have some indication of what abilities children have before they are influenced by the year of schooling we wish to study. It is planned also to give a sample of pupils who just started P-4 a similar test. It will be interesting to compare the results of the P-3 and P-4 entering tests. The hypothesis is that there will be very little difference, especially in rural areas where chances to use literacy skills are limited, since probably much of what was learned to pass P-2 and P-3 leaving tests was forgotten during the holidays before these pupils entered P-3 and P-4.

Phase two

Completion of teacher performance test; and pupil, parent, teacher, headmaster questionnaires, and interview schedules	Sept-Oct
Further training of supervisors and research team members; organization of field work	Nov
Application of past P-3 test and administration of questionnaires	Dec-Jan
Data coding and punching	Feb-Mar
Data processing	Apr-Aug
Report	Sept-Oct

Administration

It is intended that the project will be administered by the NEC in cooperation with MOI and MOE. A professional advisory committee will be established to help complete the study's design, prepare a sampling plan, construct research instruments, supervise data collection and processing, and write the research report.

Appendix D

Project IMPACT

SEAMEO Regional Center for Educational Innovation and Technology
(Five-Year Development Plan, Saigon, July 1974, p. 18a-24a)

Background

Project IMPACT is one of the two major undertakings of INNOTECH in response to the priority established by SEAMEO to focus on the "Development of an Effective and Economical Delivery System for Mass Primary Education."

Rationale

The following list describes the main rationale leading to the design of Project IMPACT.

- approximately one-half of children in SEAMEO countries do not complete 4-5 years of primary education;
- this condition is most prevalent in rural communities in which some 70% of the population lives;
- education budgets are already strained, and the focus of INNOTECH research should not be on ways to increase funding;
- traditional means of education (teachers, classrooms, etc.) cannot simply be expanded because funds are not available;
- nontraditional alternatives must be found that are both effective and economical;
- mass media is expensive (TV) and limited (radio) as a means for delivery of rural primary education;
- 80-90% of educational costs are those associated with teachers;
- ways must be found to increase the student-teacher ratios (perhaps to as much as 200:1);
- with increased student-teacher ratios, classroom teaching is unlikely, and the role of the teacher may change to one of managing educational experiences;
- inexpensive community resources of all kinds (parents, skilled workers, older students, materials, buildings, etc.) should be utilized;
- students/parents may have to be responsible (self-directed) in taking advantage of educational opportunities;
- most learning may have to be self-instructional (or "nonteacher" learning) under the management of the teacher, but under the direction and tutoring of parents, community members, and older children;
- a means should be provided for individual learning rates and exit and reentry into the educational system at any time (as one means of avoiding dropouts and wastage).

Description

From the above rationale the original design of Project IMPACT has been developed. As exemplified in the descriptions below, the acronym for IMPACT is appropriate: Instructional Management by Parents, Community and Teachers. IMPACT, though innovative, is basically a management system of instructional/learning procedures that themselves have been tried and proven successful elsewhere.

1. An Instructional Supervisor represents the only institutionally trained professional educator. The traditional teacher's role is eliminated, and the Instructional Supervisor acts as a manager of instruction providing the needed direction and organization in the use of a variety of learning resources. One Instructional Supervisor should be able to manage the instruction of 200 primary students.
2. Community members with particular skills (carpentry, homemaking, agriculture, health, religion, etc.) are enlisted to provide specialized instruction. They probably are unpaid volun-

teers who have been recruited by the Instructional Supervisor on the basis of a survey of community resources in relation to educational needs.

3. Other volunteer community members and older students, who are primary school graduates, would be trained by the Instructional Supervisor to conduct specific courses, i.e., beginning reading on a part-time basis. Their training would be very specific to the course they teach, and they probably would function as programmed teachers. Some could assist in the operation of the community learning centre, including keeping records and evaluating student progress.
4. Older students would all be expected to assist younger students through tutorials and remedial instruction. They would be unpaid.
5. Parents would be trained to monitor the instructional activities of their own children and be expected to take responsibility for their children's progress. Students and parents jointly would be self-directed in terms of student progress, age of beginning formal education, and age of completion.
6. There probably would be no particular age limits. Except for learning reading skills, students would not be encouraged to begin at an early age.
7. Education would be modular, each learning module covering the amount of instruction that would normally take 1-2 weeks. Each module would be designed for the learning of specific educational objectives and would contain both a readiness test and a posttest.
8. Many modules would be in the form of individualized instructional packages. Students typically would seek tutorial help from assigned older students whenever they experience difficulty.
9. Some learning modules would be in the form of small group instruction under the direction of teacher's aides from the community. Others could be tied to instructional radio programs.
10. Printed modular materials would be reusable by other students as soon as they are completed by those who progress more rapidly.
11. There would be very few set class periods. Students would be able to drop out and reenter at any time.
12. Primary education would be ungraded; progress would be indicated by learning modules satisfactorily completed rather than by school levels (grades).
13. All materials and records would be maintained in the community learning center.

Research Design

The primary theme of Project IMPACT research is flexibility and learning from experience; the description above may not be an apt one when the IMPACT system is fully developed. Some aspects of the system may not work as expected and will have to be revised. The research schedule itself is relatively flexible because each phase must operate effectively before the initiation of a new phase.

Research sites: "Village Clusters" are located for experimental purposes in the rural areas of the Philippines and Indonesia. In the Philippines, five villages are included near the town of Naga on the Island of Cebu. In Indonesia, four villages are included near Solo in Central Java. The number of primary school-age children at each site is about 1 200.

Research staff: 11 professionals work full time at each site. They include:

- Project Director
- Project Associate
- Instructional Methods Expert
- Subject Matter Experts (6)
- Instructional Materials Officer
- Rural Education Coordinator
- Village Teachers (approximately 6 part-time)

In addition, the staff is supported at each site by:

- Typists (3)
- Printers (2)
- Driver
- Messenger

INNOTECH's Saigon staff coordinates the activities of these companion projects through regular correspondence and monthly visits. Two external advisers (experts in instructional methods) will assist field work, living at the sites.

Project Phases:

1. Develop comprehensive planning document
2. Prepare and conduct an acceptance campaign at national and local levels to ensure that the

- project is both understood and supported.
3. Select field sites and villages
 4. Recruit local staff
 5. Recruit selected teachers from villages
 6. Evaluate and remediate for 4th grade reading in the language of instruction. (In both countries, the language of instruction for the 4th grade is different from the local dialect, and instruction through the 3rd grade is in the local language. It is necessary to ensure that the children are able to read so that they may benefit from the IMPACT learning modules in the language of instruction. Thus, evaluation and remediation is important.)
 7. Develop 4th grade instructional modules, trying them out in draft and revising before production. (At least one half-year of learning modules must be readied before beginning the formal experiment. This is necessary because most of the modules will be self-paced, and some children may accelerate faster than others.)
 8. Begin "in-school" operations at the 4th grade:
 - initially include only two subjects, the national language plus one other, so that teachers, children, and staff will not be overloaded and will be able to help students having early difficulties;
 - initially the teacher will play all instructional roles of Instructional Supervisor, monitoring parent, and tutor (solely in the classroom) and will be assisted by project staff;
 - once procedures in the classroom are working well and all involved are comfortable in their roles, modules will be assigned as "homework" and parents will be instructed in the means of monitoring their children's learning activities (Note: progress charts will be maintained at both the learning center and at each home so that parents can follow their children's program);
- At this point, the core IMPACT system will be operable at the 4th grade in two subjects:
- include all subjects in every school at the 4th grade;
 - identify community volunteers with special skills to assist in specific types of instruction;
 - develop 5th and 6th grade learning modules, introduce them into the system at all schools, and eliminate class schedules for these three grades;
 - begin comparative evaluations with control schools;
 - develop learning materials and procedures for the 1st through 3rd grades, noting that more verbal and group instruction probably will be needed until children can read simple modular material and can be relatively self-directed in their learning;
 - initiate the IMPACT system in all schools for the complete primary curriculum;
 - invite persons of all ages to take part in the IMPACT learning process;
 - develop an upgrading course for teachers to become Instructional Supervisors;
 - prepare a planning document for the expansion of the system to other sites;
 - work with school authorities to increase the student/teacher ratio by transferring present teachers to other positions.

Projected Progress as of 1 Jan 1975:

- 4th grade instructional modules will be completed;
- 5th and 6th grade modules will be completed for at least one-half the curriculum in the two grades;
- parents will be monitoring learning activities;
- older students will be giving posttests, tutorials, and remedial instruction, and will be performing as aides in the "learning center" (at this point the center is still the classroom);
- a planning document will be prepared for the development of instruction for grades 1 through 3;
- the 4th grade teacher will be managing the learning of students in the role of an Instructional Supervisor;
- 5th and 6th grade teachers will have been prepared to take over the role of Instructional Supervisor;
- firm plans will have been made for the complete system to operate in the 4th through 6th grades.

Implications

INNOTECH is confident that IMPACT will succeed, but the SEAMEO Regional Center is equally confident that the final system will differ in many ways from that projected in the project description. The key element that will be maintained is the changed role of the teacher into that of a manager of all learning experiences of a large number of students. Thus IMPACT is expected to succeed in providing effective primary education at a substantial reduction in per-pupil cost, and resources will therefore be freed to allow a significantly larger number of persons (young and old) access to a complete primary education. IMPACT can provide the marriage of formal and non-formal education, involving the whole community in the endeavour to upgrade educational opportunities.

The impact of Project IMPACT, however, will lie in SEAMEO's ability to adapt it to different countries, cultures, and demographically different communities (including urban). The INNOTECH Center plans to assist in this wide-scale dissemination by providing guidance and consultative support.

Appendix E

List of Participants at the IDRC Education Research Priorities Meetings

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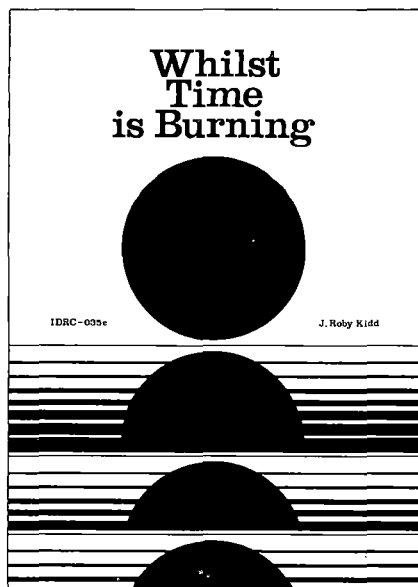
B) Cha-Am, Thailand, 26-27 October 1974

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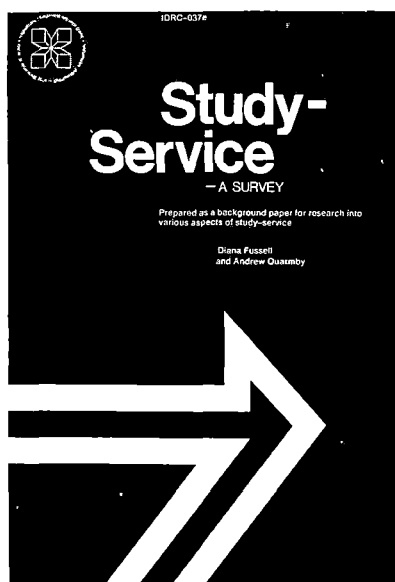
TWO ADDITIONAL MONOGRAPHS ON EDUCATION



Whilst Time is Burning by J. Roby Kidd

120 pages illustrated paper cover IDRC-035e

IN this monograph (sub-titled "a report on education for development") the author looks at the successes and failures of the many plans and dreams for education made during the ambitious 1960's. He examines why many of these schemes did not succeed and how most of the major problems of illiteracy, unemployment and underemployment, inadequately qualified manpower, and irrelevant and outdated educational systems still remain. Professor Kidd examines the vast range of alternative ideas, innovations, and educational aids available in stressing that there is no one, easy, solution to the problems. He suggests that some of the great variety of possible alternatives be tried and tested, so that they may be adapted to suit local needs. As he points out, the problems of education are not unique to developing countries, and there is a great need for improved communications internationally, as well as more sensitivity to conflicting or mutual needs.



Study-Service — a Survey by Diana Fussell and Andrew Quarmby

42 pages illustrated paper cover IDRC-037e

THIS report, prepared as a background paper for research into various aspects of study-service schemes, grew out of a seminar on this type of approach to education held in Yogyakarta, Indonesia (November 1972). The authors outline what is happening in a number of countries — especially African and Asian — in the development of such schemes, which are programs designed to provide participants with a useful educational experience and at the same time render practical service to the community. The authors give a general picture of why such schemes are being created, what they do, why different methods of approach are being used to introduce the schemes into communities with different needs, what constraints they operate under in the community, what the incentives are to introduce study-service, and finally, some areas where further research is needed.

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