

BRIDGES Workshop
July 25-26, 1990

"How Can BRIDGES Contribute to the Education For All Initiative?"

A Harvard University and USAID-Sponsored Workshop on the
Worldwide Improvement of Access and Quality of Basic
Education.

Rosslyn Westpark Hotel, Arlington, Virginia.

AGENDA

DAY 1, JULY 25

- 8.30 Coffee and pastries.
- 9.00 Workshop Opening
Sam Rea, Director, Office of Education, Science
and Technology Bureau (S & T), USAID.
Antonio Gayoso, Director, Human Resources, S & T,
Bureau, USAID.
Richard Bissell, Assistant Administrator, S & T Bureau,
USAID.
Noel McGinn, Principal Investigator, Basic Research and
Implementation in Developing Education Systems Project
(BRIDGES), Harvard Institute for International
Development (HIID).
- 9.30 Module 2: Education's Contribution to Development.
Educational Impacts Model (EIM) presentation.
Jennie Spratt, Research Scientist, Research Triangle
Institute (RTI).
- 10.00 Panel Discussion 1/ Leaders: Cliff Block,
Deputy Director, Office of Education S & T, USAID, and
Tom Nicastro, Head, Human Resources, Asia and
Near East Bureau, USAID.
What can models like EIM bring to the educational
planning process ?
- 10.30 BREAK
- 10.45 Module 4: Setting Goals.
Optimizing Policies for Educational Systems (OPES),
presentation. Frank Healey, Research Scientist, RTI.
- 11.15 Panel Discussion 2/ Leaders: Frank Method, Planning and
Policy Coordination Bureau, USAID, and Adriaan
Verspoor, Chief, Population and Human Resources Dept.,
World Bank.

- 11.45 Module 7: Access and Equity: What are the issues?
Frank Dall/ HIID Project Manager, BRIDGES.
- 12.15 Panel Discussion 3/ Leaders: Rosemary Bellew,
World Bank and Janet Leno, World Bank.
- 12.45 LUNCH BREAK. In-house Buffet Lunch.
- 2.00 Module 6: Allocating Resources.
Introducing EPICS (Education Policy Simulation)
Christina Rawley, Haroona Jatoi, Claire Brown,
HIID/Project BRIDGES
- 4.00 BREAK
- 4.15 EPICS debriefing - Christina Rawley
- 4.45 Panel Discussion 4/ Leader: Carlos Malpica,
International Institute for Educational Planning,
(IIEP), and John Boich, Canadian Research and
Management Consultants (CRMC).
- 5.15 Information about evening schedule.
- 7.00 WORKSHOP DINNER

DAY 2, JULY 26

- 8.30 Coffee and pastries.
- 9.00 Module 8: Improving teacher effectiveness.
What strategies work ? Andrea Rugh/ HIID
Consultant.
- 9.30 Panel Discussion 5/ Leaders: David Chapman, Associate
Professor of Education, University of New York, Albany,
and Linda Dove, World Bank.
- 10.00 Module 10: Implication of changes in internal
efficiency.
Will reducing repetition make a difference ?
Noel McGinn, HIID Fellow, Professor, Harvard Graduate
School of Education (HGSE).
- 10.30 Panel Discussion 6/ Leaders: Richard Pelczar,
Senior Technical Advisor, Office of Education, S & T,
USAID, and John Lawrence, Senior Advisor, Human
Resources, UNDP.
- 11.00 BREAK
- 11.15 Module 11: Learning outcomes: What the literature

says? How can educational quality be improved cost-effectively?

Bruce Fuller, Associate Professor, HGSE.

11.45 Panel Discussion 7/ Leaders: Joseph Carney, Head Human Resources, Latin America Bureau, USAID and Tom Tilsen, Director of the Radio Learning Project, Education Development Center (EDC).

12.15 LUNCH BREAK. In-house Buffet Lunch.

1.15 Module 13: The significance of well-managed schools. What role does management play in enhancing school quality?

Bill Cummings/HIID Research Associate, Lecturer, HGSE.

2.30 Panel Discussion 8/ Leaders: Mike Basile, Deputy Project Director, Improving the Efficiency of Educational Systems, (IEES) and David Burleson, UNESCO-UNICEF Liaison Officer, New York.

3.00 BREAK

3.15 Module 15: Implementing educational change. What role do contextual factors play in implementing change ?

Don Warwick/ HIID Fellow and Professor, HGSE.

3.45 Panel Discussion 9/ Leaders: Don Russell/Kurt Moses, Directors of the Advancing Basic Education and Literacy Project, and Dr. Nyi Nyi, Director, UNICEF Program Division, New York.

4.30 Closing Panel.

What role should BRIDGES play in an on-going EFA agenda?

Panelists: Carlos Malpica, International Institute for Educational Planning, (IIEP), Elizabeth King, World Bank, David Burleson, UNESCO-UNICEF, Paul McGinnis, Canadian International Development Agency, (CIDA), Antonio Gayoso, USAID. Convenor: Frank Dall, HIID/BRIDGES.

5.30 Workshop ends.

INTRODUCTION

This two-day intensive event was conceived of as the first in a series of dissemination workshops intended to share research findings generated by five years of USAID-funded policy research activities organized and carried out under the "Basic Research and Implementation in Developing Education Systems" Project, by the Harvard Institute for International Development (HIID) in collaboration with Michigan State University (MSU), Texas Southern University (TSU) and the Institute for International Research (IIR).

After some debate both within BRIDGES and at the USAID Science and Technology Bureau, a decision was taken to consolidate scarce resources into one well-focused event which would attempt to make relevant and share the outcomes of our BRIDGES research experience with the broader audience of international agency program officers, and with U.S. based international educators, planners and policy makers to begin to address some of the concerns and issues raised at the recent "Education for All" conference in March 1990, in Jomtien, Thailand.

Among the many concerns addressed in Jomtien was the issue of how best to bring about an improvement in the quality of basic education during an era of diminishing public sector investments in education. Growing political pressure fueled by an unprecedented world-wide demand for more education, the dramatic growth of world populations and a heightened sense of the need for access to better information and more appropriate survival skills from consumers, are forcing governments to pay more attention to education reform. Which strategies, for instance, existing or yet to be tried, can best be applied by hard-pressed policy makers and administrators of donor agencies to meet this apparently insurmountable demand-supply problem in ways that will produce a more efficient investment of scarce educational resources, but also provide better access for marginalized groups like the urban and rural poor, and women?

Those committed to implementing the BRIDGES agenda held that part of the answer to this question would be found in a broader and more rigorous application of research methodology to a range of unanswered questions at all levels of the educational process. It was argued, with some justification, that part of the problem lay with the absence of a well-organized Third World information base which could be used by planners and policy makers to assist in choosing the most appropriate policies for bringing about the desired changes in their education systems. Notably absent were empirically-derived studies from which informed decisions could be made about how best to improve the most neglected first 10 years of the educational systems in question.

The research outcomes we will share during this workshop represent only some of the work on basic education carried out by BRIDGES in eight different countries, over a five year period between 1985 and 1990. We invite you, therefore, to apply your knowledge, insight and wide experience in making the fruits of our labor more easily accessible, and more relevant to the needs of all learners, teachers and administrators whose educational systems need improving.

BRIDGES DISSEMINATION MATERIALS

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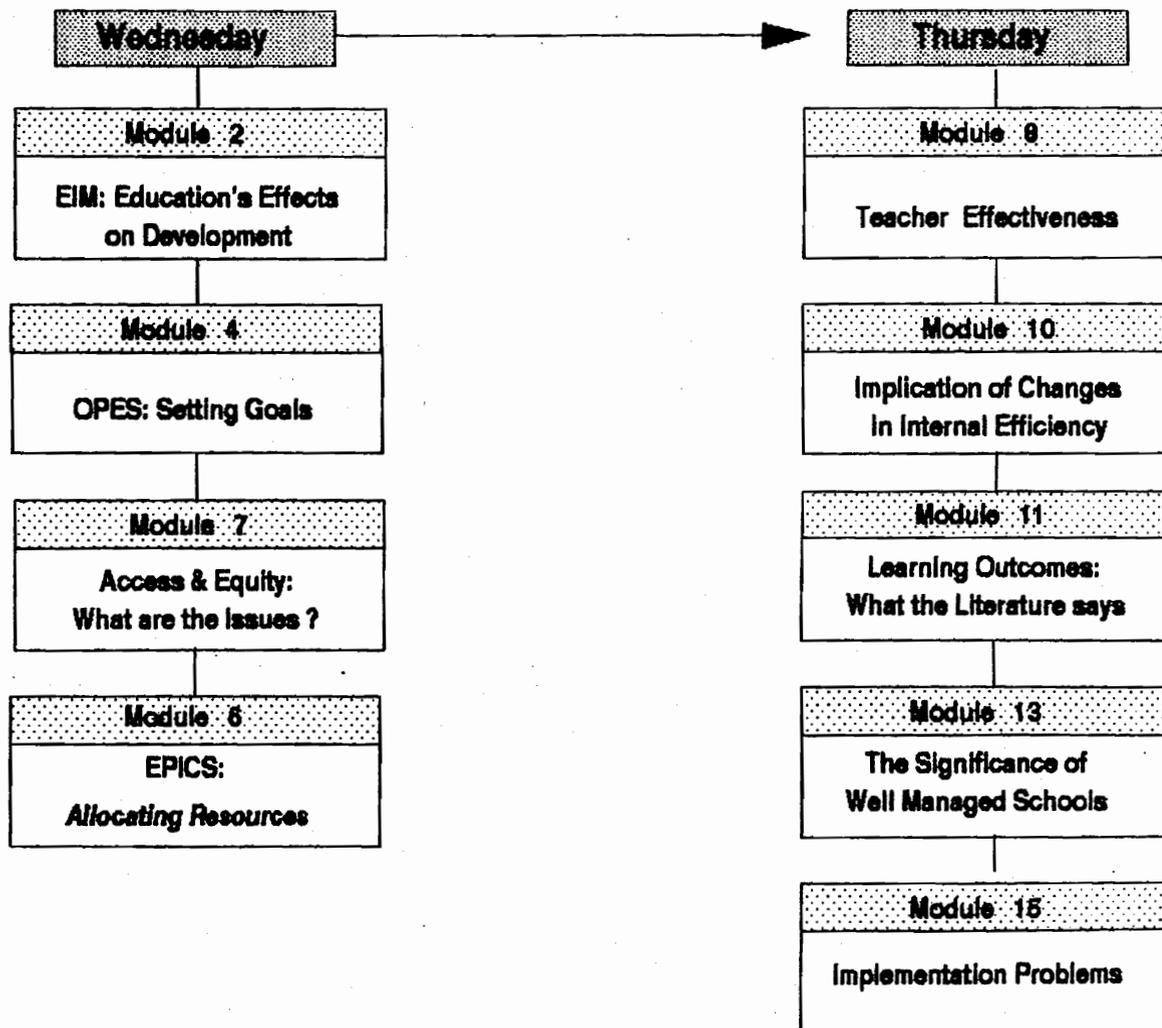
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Module 15 - Implementation Problems

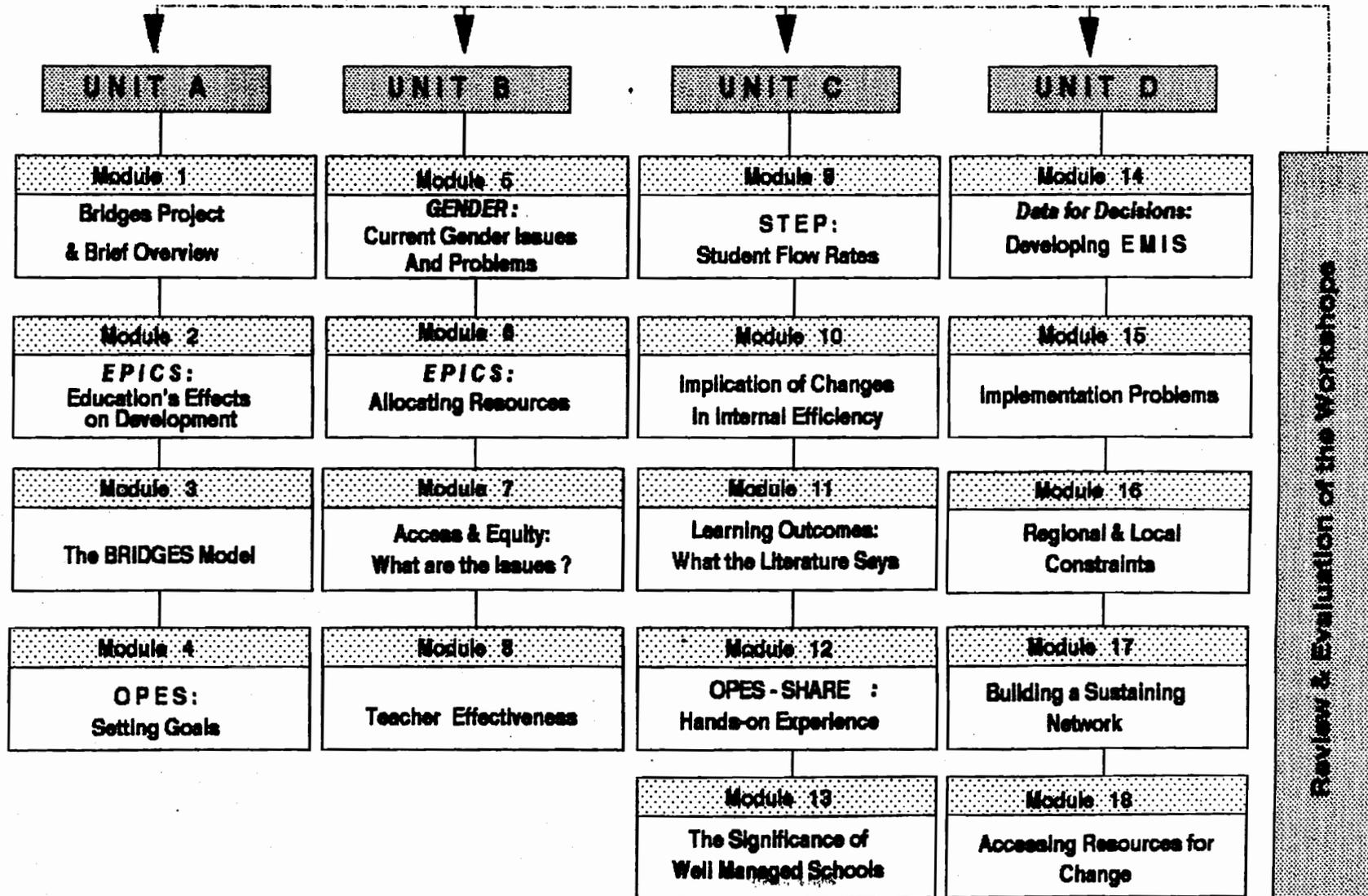
BRIDGES DISSEMINATION WORKSHOP

The Rosslyn West Park Hotel

Washington DC. July 25-26, 1990



**BRIDGES
DISSEMINATION WORKSHOP**



THE COURSE DESIGN

Rationale

When the notion of holding dissemination workshops was being discussed, it was generally agreed that three initial workshops be held, one in each of the following regions: Latin America, Africa and Southeast Asia, or the Mideast. It was in these regions that the demand existed for what we had to offer.

A flexible course design was selected over other alternatives in order to try to resolve the following dilemma. The request was for workshops which would be both brief and to the point, and at the same time pitched to the different educational needs of each of the regions.

A modular design has the twin advantages of allowing the course organizers to flexibly choose the course content to match the educational needs of each individual region, while at the same time tailoring the length of each course to suit a specific audience. Clearly, it would be unrealistic to assume that a group of very busy senior administrators would be disposed to attend the full four-day workshop when perhaps a shortened two-day offering might better serve their needs. At the same time, it would be possible to invite a group of more junior ministry officials, who would be willing to spend more time learning about our policy-related research findings, to a version of the course which we think should be taught over the longer four-day period.

The high degree of flexibility implicit in a modular design would allow different course arrangements to be brought together quickly in response to the specific needs of a given group of decision makers, or the special educational needs of a region.

The following are some examples of what can be done using this approach.

EXAMPLE A

Situation: We might be called upon to do a course for senior ministry of education administrators in Saharan Africa. Two representatives of each ministry from six Saharan countries are to be invited and they have already expressed an interest in finding out more about the problem of women's access to education within their region. Unfortunately, none of the invited group are able to spare more than one or two days away from their busy portfolios and have requested that the workshop be brief and to the point.

By using the flexible modular system a one- or two-day course can be designed to meet their needs. The following combination of units and modules would probably adequately cover the requirements of this particular situation.

UNITS TAILORED TO A GIVEN NEED

The 4-unit course could be telescoped into 2 units (assuming that each unit signifies a day's worth of effort):

DAY 1 (revised)

Unit A Module 2	EIM Model/Education's Contribution to Development
Unit B Module 7	Access and Equity: What are the Issues?
Unit B Module 6	EPICS/Allocating Resources

DAY 2 (revised)

Unit B Module 5	Current Gender Issues and Problems
Unit A Module 4	OPES/Setting the Goals
Unit D Module 15	Does Implementation Present Major Problems?
Unit D Module	Summarizing and Evaluating the Workshop

By selecting appropriate content modules from the existing menu, flexible units or a workshop can be tailored to meet a specific need. This system reduces the time and energy which would otherwise be expended in rewriting and redesigning the content to suit each workshop.

EXAMPLE B

Situation: A request has been received to fly out to Guatemala to give a USAID/HRDOs regional meeting a short demonstration of how one might use the range of BRIDGES software models to run training courses for local educational administrators. We all know how busy HRDOs are and understand why they can't spare more than a day away from their offices to attend this kind of activity! However, with a reshuffle of units and modules an appropriate course can quickly be designed to meet any need.

UNIT TO MEET THIS NEED

DAY 1

UNIT A Module 2	EIM Model/Education's Contribution to Development
UNIT A Module 4	OPES/Setting the Goals
UNIT B Module 5	GENDER/Current Gender Issues and Problems
UNIT C Module 10	STEP/Implications of Changes in Internal Efficiency
UNIT C Module 12	SHARE/OPES/Hands-On Exercise

All the above modules can be turned into a hands-on practical workshop experience providing the requisite facilities and equipment are available. The way in which this kind of activity will be organized will be determined by the number of participants and the resources available.

UNIT A

Module 2

Objective(s):

1. To introduce EIM as a tool for raising awareness, promoting policy dialogue, and encouraging local research on effects of education on other development sectors.
2. To present the conceptual and empirical framework underlying the EIM simulation engine, through presentation and discussion of the EIM flow chart and the process of regression equation development.
3. To demonstrate procedures and applications of the EIM software package through hands-on training activities such as simulating the effects of specific educational budget decisions on educational participation rates.

UNIT A

Module 2

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2. To present the conceptual and empirical framework underlying the EIM simulation engine, through presentation and discussion of the EIM flow chart and the process of regression equation development.
3. To demonstrate procedures and applications of the EIM software package through hands-on training activities such as simulating the effects of specific educational budget decisions on educational participation rates.

What is EIM?

The Educational Impacts Model (EIM) is a microcomputer software system designed to demonstrate the effects of educational supply and participation on a variety of social and economic outcomes. The model simulates long-term, interactive, indirect, and gender-specific effects of user-specified educational inputs on outcomes such as population, labor force production, economic productivity, and health. EIM is intended to promote policy dialogue and local research on the socioeconomic benefits of increased participation in the educational system.

EIM is based on a series of multiple regression equations which attempt to predict or explain outcome variables of interest as a function of other "input" variables. EIM simulation begins with the estimation of the impact of user-specified educational supply inputs on male and female rates of primary education participation. These participation rates, in turn, figure in the estimation of secondary enrollments, fertility and population, labor force participation, economic productivity, and health indicators.

The equations used in the EIM are the result of extensive estimation efforts with a database of national-level time-series data on over 30 socioeconomic indicators for 80 developing countries during the period 1960 to 1985. The EIM simulation engine allows the user to apply relationships found among the variables in the existing data to simulate likely outcomes in the future. With feedback loops, results of equations characterizing existing relationships are automatically linked into a single coherent and integrated model, such that the outcome of one equation becomes an input variable in other equations as the model moves forward in time.

Use of EIM

EIM may be introduced through a short, 30 minute session or a more extended one. In the course of a short session, learner participants will gain a greater appreciation for the long-term, indirect, and gender-specific effects of educational inputs on multiple development outcomes.

Participation in a more extended session will allow the learner to know how to use EIM to produce simulation scenarios as well as understand the conceptual basis underlying the simulations.

The following activities are appropriate for either an introduction-demonstration, or for a more in-depth, hands-on introduction. For a demonstration, Activity 1 is sufficient and should not require more than 30 minutes. For a more in-depth introduction, carry out activities 2-4 as well. These activities are recommended only for a group with some research capability or interest. In this case, the whole session would take one afternoon.

ACTIVITY (1)

EIM is introduced by presenting the Storyboard. This activity requires approximately 30 minutes.

ACTIVITY (2)

Present the EIM Flow Chart: Discuss conceptual background; illustrate direct effects, indirect effects, lags, interactions, feedback loops.

Present sample regression equations and scatter diagrams of "real" data from EIM database: Discuss the multiple regression process, including dependent and independent variables, variable selection, model specification, control variables, coefficients, fit.

If there is interest and time, show the actual database and carry out one or two regression exercises.

ACTIVITY (3)

Explain how to carry out simulations using the EIM simulation set-up. For example, show the effect of hypothetical increases in the share of GNP dedicated to education versus increases in the share of GNP devoted to traditional investment.

Create graphs using the EIM simulation set-up to depict the effect of investment in education on various outcome variables. Presenters should discuss the rationale behind the selection of specific policy or target values, and the implications of the simulation results for educational policy and national development.

If time allows, show how to adapt the set-up for a new country. Carry out simple re-formulations of the set-up to show how the model is constructed.

ACTIVITY (4)

The group will discuss the simulation results using graphs produced during Activity 3. Emphasize the policy significance of the variables and results.

UNIT A

Module 4

Objective(s):

- 1. To demonstrate the usefulness of the OPES model as a training tool.**
- 2. To allow participants to use OPES in a group exercise to explore the various policy alternatives for improving an educational system.**
- 3. To examine the various trade-offs that result from alternative policy interventions.**

UNIT A

Module 4

Objective(s):

1. To demonstrate the usefulness of the OPES model as a training tool.
2. To allow participants to use OPES in a group exercise to explore the various policy alternatives for improving an educational system.
3. To examine the various trade-offs that result from alternative policy interventions.

What is OPES?

OPES (Optimizing Policies for Educational Systems) is an easy-to-use software tool which can demonstrate how potential educational policies relate to specified goals. The user is assisted in finding optimal resource allocations by examining the impact of policies on outcomes and by weighing the relative costs of policy implementation. The system contains a current annotated "knowledge base" of research information concerning the effectiveness of policies on outputs.

Additionally, OPES system has an accompanying "knowledge base" of information on the relationship between policy interventions and educational goals. Users can access the knowledge base to obtain concise summaries and bibliographies based on literature reviews and BRIDGES' research results. The knowledge base is designed to provide additional guidance in reaching optimal policy and resource allocation solutions. It can also be useful for researchers learning about the efficacy of particular policies.

Use of OPES

OPES is primarily designed as a training aid for decision-makers concerned with Third World education. It is designed to help them assess policy choices and to establish budget priorities.

OPES will be useful for:

- Understanding the trade-offs between educational goals.
- Understanding the trade-offs between educational policies and establishing priorities.
- Understanding the efficacy of policies with respect to goals.
- Assessing the desirability of suggested or past policy choices.
- Obtaining information about the relationships between educational policies and educational outcomes.
- Optimizing resource allocation to realize educational system goals.
- Understanding how varying the levels of a policy intervention will affect system outcomes.
- Recalling research findings and their integration into policy choices.

OPES relates educational inputs or "policies" and their associated costs, to educational outputs or "goals". Because there is a resource allocation aspect to the model, there exist budgetary constraints.

The system provides you, the user, with guidance concerning the effectiveness of policy options. Based on research reviews and on BRIDGES' research results, you can obtain information on the latest knowledge pertaining to the relationships between policy interventions and education system outcomes.

To begin, the user must enter a weight for each goal. Weights must consist of an integer between 0 and 10. The higher the weight the more important the goal.

1. The least important goal should have a weight of 1, as long as it is of some small positive importance. All others should be multiples of the lowest. For example, if Equity has the lowest priority, 1, and Access is judged to be five times more important, then Access should have a weight of 5. If Moral Development is judged to be equally important as Equity, then Moral Development should have a weight of 1.
2. Goals not taken into account have a weight of zero.

ACTIVITY (1)

The group will see a demonstration of OPES using a screen and magnabyte projector. The group will be assisted in working on several scenarios. These scenarios will demonstrate the impact of a set of prioritized policies on predetermined educational goals. The exercise will be carried out to encourage maximum involvement of the trainee group.

The pace will match participants' motivation and understanding of what OPES can do. Individuals should be encouraged to take an active role in the demonstration.

ACTIVITY (2)

Participants will be divided into three or four small working groups and given the opportunity of using OPES to select an efficient and effective set of policy goals for the maximization of educational quality within a given educational setting. A group leader will lead his/her group through this phase of the exercise until all are in agreement as to the specific set of educational goals they wish to choose to arrive at a desired educational outcome.

ACTIVITY (3)

A member of each group should be prepared to present his/her group's findings during a plenary session at the end of this exercise. A brief demonstration and explanation should be given for selecting any given set of policy goals and why these were weighted in the manner indicated. Results may be presented on a screen or printed out in hard copy for participants to evaluate and comment on.

A quick debriefing will be carried out with the involvement of all who took part in Activities 1-3.

UNIT B

Module 6

Objective(s):

- 1. To play EPICS, a simulation game, which helps participants develop a decision-making process for allocating resources to realize a set of educational goals.**
- 2. To demonstrate a multiple strategy problem-solving approach to making decisions for potential policy-makers.**
- 3. To allow policy-makers to practice making decisions which are based on existing educational research and tailored to existing budgetary limitations.**

UNIT B

Module 6

Objective(s):

1. To play EPICS, a simulation game, which helps participants develop a decision-making process for allocating resources to realize a set of educational goals.
2. To demonstrate a multiple strategy problem-solving approach to making decisions for potential policy-makers.
3. To allow policy-makers to practice making decisions which are based on existing educational research and tailored to existing budgetary limitations.

EPICS Simulation

This simulation combines the use of computer software and negotiation skills in a decision-making environment. Participants assume the roles of leading educational administrators, planners, researchers, and decision-makers. Participants discuss and make decisions on a series of policy-related issues. Decisions are recorded into a computer simulation that assesses their collective impact on the education system over 25 years. This process of data review, discussion, and strategic planning is repeated several times. The overall objective of the simulation is to increase access, participation, and quality in the education system.

Functions of Simulations

Simulations function to:

1. demonstrate the effects of different policies,
2. allow experimentation without risk,
3. convey general principles of system behavior,
4. allow research into the behavior of a system,
5. gather information from the participants,
6. provide a shared experience to aid in discussing potential problems, and
7. convey insights about impacts on the economy, society, and political system.

Functions of EPICS

The EPICS model:

1. illustrates the need for researching and targeting educational groups,
2. emphasizes the importance of multiple strategies,
3. demonstrates the quantitative and qualitative effects of different policies,
4. facilitates discussion about resource allocation under budget constraints,
5. shows the delays involved in setting up programs, and
6. gives practice in communication, negotiation, and group strategy design.

Simulation Workshop Requirements

This simulation workshop requires the participation of at least six people and a workshop coordinator.

Player Roles

- Minister of Education
- Secretary of Education
- Director of Finance and Administration
- Director of Planning
- Education Management Information Systems Officer
- Director of Research

Player Goals

- Increase access
- Increase participation rates
- Target several population groups

Population

Players design and implement policies that impact on the following populations:

- Urban
- Rural
- Male
- Female

(Socioeconomic status is implicit in the model.)

EPICS Policy Options

The game simulates the planning and policy environment in which investments can be made in the following areas:

- **Planning and Management**
 - EMIS -- Organizational implications
 - Technological inputs
 - Professional development
- **Policy Research**
 - School area survey
 - Facility survey
 - Target group survey
 - Case reports
- **Differential Education**
 - Training Programs
 - Material Development
- **General Education**
 - Training Programs
 - Material Development
- **Organization**
 - Academic schedule
 - Double shifts
 - Subsidized textbooks
 - School clusters
- **Facilities**
 - School construction
 - Desks and chairs
 - Water

Steps of Play

After the pre-simulation briefing has been completed, the game will begin with each round following the five steps:

Step One. The Minister will begin the round by asking each player to give a summary of information concerning the existing state of the system and proposals for action.

Then the group must decide in which categories to invest *Kf* and move its *Kf* chips from the inner circle to the inner wheel. Participants are not required to spend funds in each category.

Categories include: **General Education** (broadly ranging across all groups); **Differential Educational** (targeted at special groups); **Facilities**; **Organization**; **Education Management Information Systems (EMIS)**; and **Policy Research**.

Step Two. The group must then distribute all the allocated funds to programs within each category on the second wheel of the board (move *Kf* chips in the inner wheel out to outer wheel). Participants are not obliged to spend credits on every option in the second wheel.

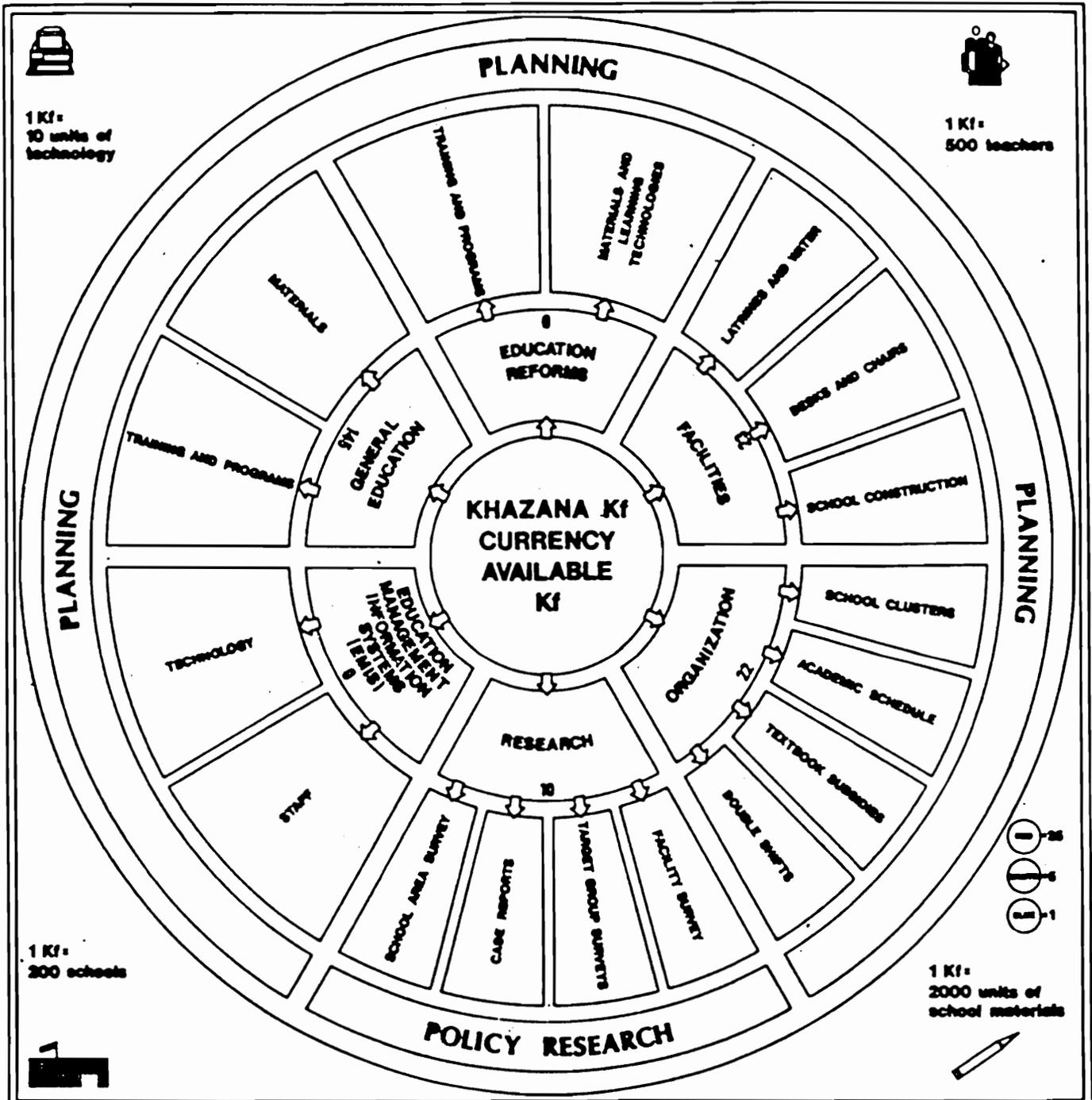
Step Three. Fill in the decision sheet according to budget allocations.

Step Four. Participants will receive results of their decisions in a computer feedback report. **The nature and quality of the information participants receive depends on their investment decisions.** The results measure the status of the country at the end of the first time period.

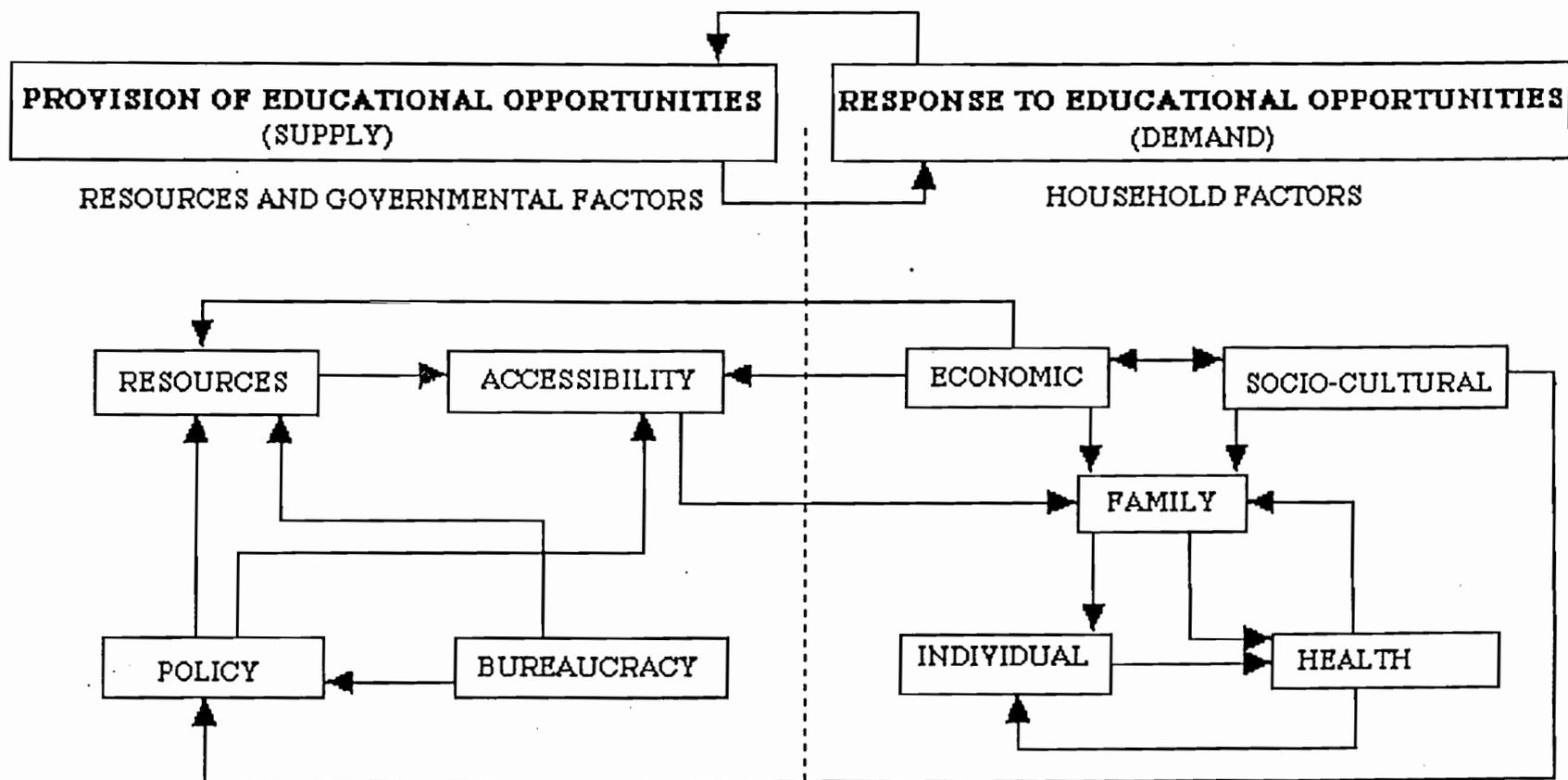
Step Five. Remove the *Kf* chips allocated during the round from the game board and begin another round with Step One.

EPICS Game Board, Policy Options, and Decision Sheet follow.

EPICS Game Board



A MODEL OF FACTORS ASSOCIATED WITH ACCESS TO EDUCATION AND RETENTION



Policy Issues to Consider

Supply

Demand

policies to increase
supply

vs.

policies to increase
demand

policies to increase
overall enrollments

vs.

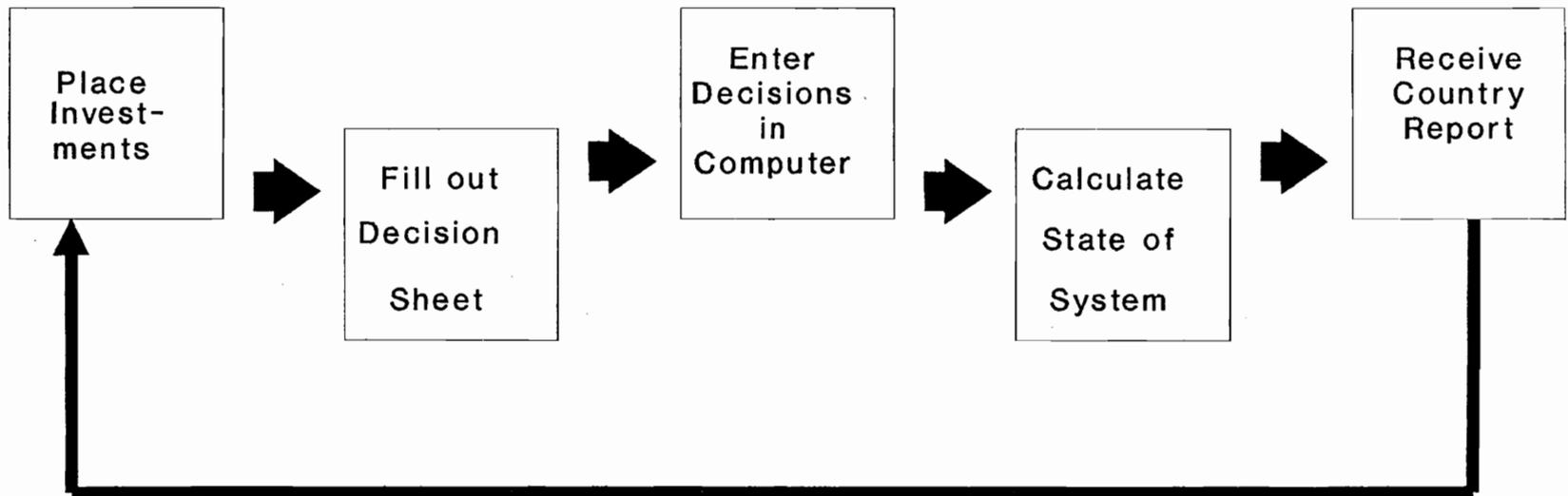
policies to increase
enrollments of
groups currently
underrepresented

policies to improve
opportunities to
enroll

vs.

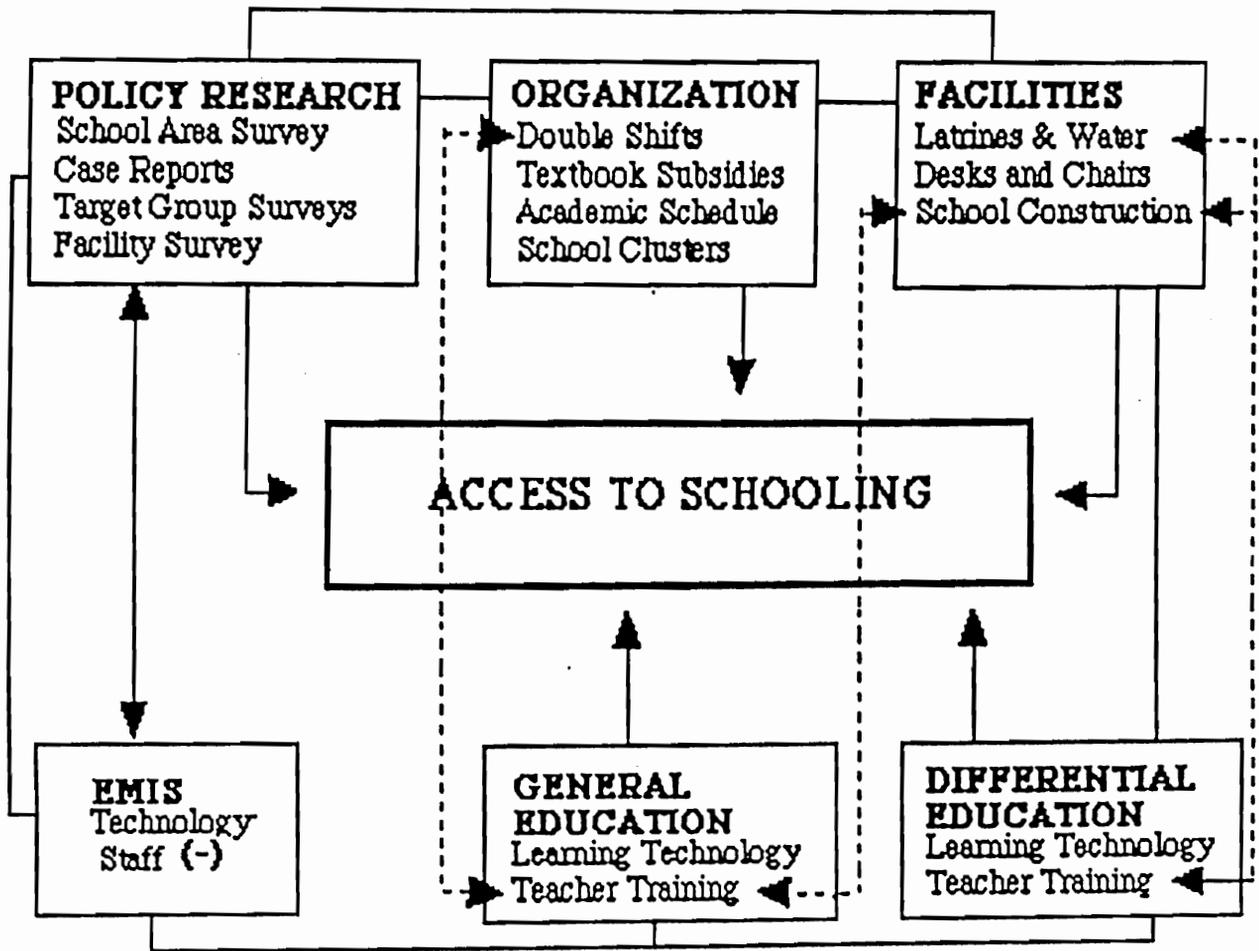
policies to increase
retention of those
who are already
enrolled

Structure of Simulation



EPICS

EDUCATION POLICY SIMULATION MODEL



———▶ Causal Relationship (Quantified positive or negative value)
 - - - -▶ Compounding Values (Quantified positive or negative value)
 ——— Indicates Relationship (Represented by quantitative or qualitative data; positive or negative value)

Policy Issues to Consider

- How will expenditures be balanced between education policies?
- How will expenditures be allocated between General Education and Differential Education?
- How will the money be allocated over time?
- What impact will policy choices have on different population groups?

UNIT B

Module 7

Objective(s):

- 1. To examine issues of educational access as these relate to disparities among groups in society.**
- 2. To identify the factors which have been found to lead to differential educational access and educational disparities.**
- 3. To discuss the various policy options available to governments for addressing educational access and disparity.**

UNIT B

Module 7

Objective(s):

1. To examine issues of educational access as these relate to disparities among groups in society.
2. To identify the factors which have been found to lead to differential educational access and educational disparities.
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Introduction

Most governments and their Ministries of Education are committed to providing access to schooling to all the children of their societies. However, many governments of Africa, Asia and Latin America inherited inadequate educational systems (many from former colonial rulers) and face severe resource constraints for building up their educational systems. Thus, many of them have not yet been able to achieve their goal of one hundred percent enrollment. In the past, it has been assumed that as resource allocations to education are increased so that more classrooms can be opened, problems of access will be overcome.

However, experience and research have shown that issues of access to education, especially as these relate to social and political equity, are more complex. Repeatedly we have seen situations in which policies have been initiated that were intended to increase access to schooling for all children but which, in fact, resulted in increased participation by some groups of children while other groups were either left out entirely or were under-represented (in enrollments).

Education is seen both as a basic right to be provided by governments to citizens and as an input into further development. Thus, failure to enroll certain groups of children can create divisiveness within societies and/or result in pockets of underproductive people which reduce or skew development.

Access and Disparity: The Issues

In general, the countries of Africa, Asia and Latin America have made important strides in providing schooling to their children. From 1960 to 1985, enrollment rates for children between 6 and 11 years of age went from 32.7% to 65.9% in Africa, from 54.4% to 73.6% in Asia and from 57.7% to 83.5% in Latin America and the Caribbean.¹ In spite of these gains, the number of children not in school remains high, and in some countries it has actually risen during this same time period.

Even more important than gross enrollment rates is the issue of disparity. While some children have enjoyed increased access to schooling, others have lagged behind. Government education policy-makers seek policy options that both increase gross enrollments **and**, at the same time, lead to improved equity in the relative enrollment rates of different groups of children.

For example, in some countries overall enrollments are low (because resource constraints mean that there simply are not enough places in school for all children) but all **groups** of children have equal access to the limited places that exist. In others, overall educational opportunities may be as low (or they may be higher), but children of particular groups know that their chances of attaining access to school are much lower than the chances of other children **by virtue of some particular characteristic which places them in a disadvantaged group**. These circumstances pose quite different options for students and result in quite different dynamics among groups in societies. Consistent disadvantaging of certain groups can impede general economic and social development.

Module 7 in this series presents research on the relationships between educational access and disparity for boys and girls in different countries. Interestingly, some countries have improved overall enrollment rates and reduced disparity rates at the same time, while others have increased overall enrollments by increasing schooling primarily for boys with girls' participation lagging far behind (i.e., increasing disparity rates as well). The differences in these experiences indicate that the policies which governments pursue to improve access may either improve access for all children or may seriously disadvantage certain groups while benefitting others.

¹ Anderson, Mary B., "Improving Access to Schooling in the Third World: An Overview," BRIDGES Research Report Series, No.1, Harvard Institute for International Development, Cambridge, March 1988, based on data from The Hunger Project.

Factors Which Affect Access

Evidence indicates that certain groups in virtually all societies are disadvantaged both in terms of entry to educational institutions (access) and in terms of opportunities to complete the various levels of education (retention). There are seven factors which have been found to affect educational participation differentially. In many cases, these factors overlap, compounding the problems of access for certain groups.

1. Remoteness. The first factor that limits access of children to education is remoteness. Data clearly show that, in all systems, rural children have less opportunity for schooling than urban children. This is for several reasons. For example, schools have generally first been built in areas of denser population so that more children can be served. Only when these are complete have schools been extended to the hinterlands. Even when schools are built in rural areas, because populations are dispersed, children have farther to walk to reach schools and those who are farther away are less apt to attend, or attend less regularly. Weather conditions can affect attendance when children have long distances to travel.

It is also more difficult to supply other educational resources to rural or remote areas than to population centers. For example, it is difficult to recruit and retain teachers for service in remote areas, especially when these are distant from the teachers' own homes. Distribution of materials, textbooks and other classroom aids is also more difficult the greater the distances to be travelled. Supervision and follow-through for educational policies and initiatives are more difficult in remote areas than in those close to the seats of policy-making.

Other facts of rural or remote life affect children's participation in school. Remote and isolated people may speak local languages not included in national curricula. Standard national curricula may be seen to be irrelevant to rural life. And, rural children may have a more central role to play in family survival by working in fields or in the household than urban children so that they are regularly or seasonally out of class. This affects both their entry into school and their opportunities to progress through the educational system.

2. **Poverty.** The second general factor which limits educational access is poverty. Children of poor families are less apt to attend school, less apt to achieve in school if they attend, and less apt to complete school than children of wealthier families. Again, research shows that there are several reasons for this.

First, there is a kind of vicious circle of poverty and low educational attainment in which parents with low education have low earnings and, in turn, neither can afford to send their children to school nor have supportive attitudes toward education. Second, if there are direct costs associated with schooling, poor families are often unable to afford these. Even when education is ostensibly "free," families in extreme poverty often cannot afford to allow a child to attend school rather than work because the income which that child could earn during school hours is important to family survival. Third, poverty, itself, affects school attendance and performance in that malnourished children cannot walk so far to school, are more often ill and absent, and have shorter attention spans for school work. It should be noted that, while poverty is itself a factor affecting educational access, poverty and remoteness often go hand in hand because income levels in rural areas are almost always below those of urban areas.

3. **Gender.** The third factor that affects access to schooling is gender, with entry, participation and retention rates for girls being generally lower than those for boys. While one-fourth of all school aged children in the developing countries are not in school, about 40% of primary age girls and almost 60% of girls between 15 and 19 years old are out of school.²

Obstacles to education for females arise both from outside and from within educational systems. They include cultural attitudes and expectations, a perceived irrelevance of female education to economic activity and opportunity, and educational approaches and methods offered through the schools which discourage or deter girls' education.

Cultural traditions about the social roles of females often affect girls' educational access. A clear example is when purdah restricts girls' access to public places, including schools, but it is also the case that many countries without the religious injunctions of purdah limit female mobility out of concern for propriety and safety.

² Sivard, Ruth Leger, "Women: A World Survey," Washington, D.C., 1985, p. 18.

In some cases, young girls are free to move about and associate with others but, once puberty is reached, restrictions are increased on female public interactions. These restrictions are not without cause in that there is evidence from several countries that girls do become pregnant in school settings and that pregnancy accounts for the majority of female dropouts in some situations. In addition, early marriage more often interrupts schooling for girls than for boys, though both early marriage and school leaving may be the results of cultural expectations rather than the former being the result of the latter.

Economic activities or expectations influence girls' and boys' schooling patterns differently in many societies. Both boys and girls may be kept out of school because of other family survival tasks which they must perform, as noted above in the discussion of poverty and access. However, data show that this limitation is more often experienced by girls than by boys because girls' activities are often related to household production which requires regular, often daily, execution of tasks. For example, water and firewood (which in many societies are gathered by girls) must be provided on a regular basis for family survival. Food preparation, caring for younger siblings, other household maintenance are jobs usually assigned to girls and require regular, continual attention. Except in the poorest of families where their constant work is also required, boys are more apt to be assigned to tasks that are seasonal in nature, such as land preparation for farming or harvesting. They are, therefore, allowed to enter and attend school except during these seasons.

Expectations about the usefulness of education for girls and boys also affect parental decisions about investing in schooling for their children. In most societies, education is seen as opening opportunities into the formal labor market. Also in most societies, such opportunities are more limited for females than for males. Hence, education is seen as less likely to bring the desired results for girls than for boys.

In some circumstances, education may actually diminish a woman's chances of marriage if it is associated with expectations that she will be disobedient to or less apt to support her husband. When the cultural norm is that a woman, once married, joins her husband's family, then her own parents may conclude that, because any later benefits that come from her childhood education will help her family of marriage rather than them, it is not a good investment for them to spend on her early education.

There is growing evidence that what goes on inside the schools also affects female participation and completion. Several studies find a positive correlation between the presence of female teachers in schools and the attendance and retention of girls. This may be because parents feel safer when their daughters study with women; it may be the result of "role-modeling" where girls (and their parents) see that education does result in worthy employment for some women.

Curricula can influence girls' attendance also. Effects have been found in two different directions. On the one hand, there seems to be a demand that education be relevant to girls' lives and work, thus that subjects be tailored to their particular economic and social expectations. On the other hand, when girls have been tracked into subjects thought to be more appropriate for them than the general curriculum, parents have in some instances complained that their daughters were receiving inferior education to that given to boys and have, as a result, withdrawn their daughters from school.

4. Intra-Family Composition and Birth Order. The fourth factor which affects access to education is family composition combined with the birth order of children and gender considerations. Some studies show that parents' decisions about whether and who to send to school are linked to the number of children and the number of girls relative to boys, as well as the order of the births of these children. For example, many poor families will send only one family member to school. Usually this is a younger child because older male children are expected to enter the labor market to help support the education of the younger child and usually it is a boy child because males have greater freedom to interact effectively in public markets (thus ensuring that the family's investment in one child's education will pay). Girls without brothers are more apt to go to school than girls with brothers, because, for the reasons cited above, families will favor male over female education. Where male family members are expected to take lifelong financial responsibility for female family members, the more daughters a family has, the more likely the father is to insist on education for his sons (to prepare them to support their sisters).

While the disadvantages of being remote, poor or female were seen to be important factors affecting school participation in many societies, the influence of family structure and birth order on educational access varies widely among societies. Within any given society, however, it may play an important role in affecting school participation and, because of this, policy-makers should consider, in context, the likely importance of such factors on their goals of universal access to education.

5. Race, Ethnicity, Tribal Identity, Religious Affiliation. The fifth factor found to affect access to education is that of some kind of subgroup identity that separates people from the predominant and usually more powerful mainstream group(s). In general, any group that is disadvantaged or disenfranchised because of prejudice will also suffer disadvantage in terms of educational opportunity. Sometimes such discrimination is obvious as when schools are actually segregated by race, ethnicity, tribal origin, or religion (though some religious groups, while not dominant in their societies, provide superior education to children of their group).

More often disadvantage arising from or linked to general prejudice is embedded in structures and institutions that reflect a history of discrimination but which, by themselves, are not obvious. For example, when certain groups have suffered historical discrimination, it is unlikely that many of their group will have attained high enough education to become a teacher. Lack of teachers with whom subgroups identify can limit their desire to attend school. Other examples of embedded discrimination include examination biases, "mother-tongue" instruction policies, and discrimination in housing or mobility affecting proximity to schools.

6. Handicaps and Needs for Special Education. Some studies find that even those Ministries of Education which have explicitly stated policies of compulsory universal education "excuse" handicapped students from attending schools. Such exclusion can simply reflect the fact that the school system has inadequate resources and that the provision of education to handicapped persons is seen to be too costly relative to expected returns. In some cases, however, exclusion for handicapped persons arises from prejudice against people who differ from the norm.

Disadvantaged access to schooling for handicapped children interacts with and reinforces disadvantage from remoteness and poverty discussed above. Insofar as poorer families and those which are more removed from medical care may have higher incidence of handicap among their children, these factors could bear directly on each other.

7. Children in Motion. The last factor which affects access to schooling for specified groups involves the circumstances of being on the move. The most important example of this circumstance arises among nomadic populations where children are not settled in one location long enough to attend schools. Again, provision of education to these groups may be desirable to governments but, given scarce educational resources, seen as lower priority than providing education to other groups.

The other group of children in motion, increasing in numbers and importance in some areas of the world, are children of refugees. When these children are located in camps, administered by the United Nations High Commissioner for Refugees, they sometimes receive education superior both to that which they received prior to refugee flight and to that received by local children in the country of asylum. On the other hand, when they are attempting to integrate into an asylum country, their sheer numbers can overwhelm local schooling causing overcrowding, a drop in quality of education and resentment from the local population whose children are suffering from the influx.

When Ministries of Education adopt policies intended to increase general access to education, they will be more likely to achieve the goals they seek if they consider the conditions in their own context to determine whether any of these seven factors which affect access may be important in this context. In situations where any one or more of these factors has affected educational access in the past, policies should be designed to address the specific issues which perpetuate differential, and unequal, access. We turn now to an examination of the policy options which MOEs have for addressing and overcoming differential barriers to educational access.

Policy Options for Addressing Access and Disparity Issues

Before we examine the categories and types of policies available to MOEs for increasing access without, at the same time, increasing educational disparities, a few points should be made. First, it is important to note that educational systems reflect and reinforce the larger socioeconomic and political contexts in which they exist. Therefore, they cannot alone overcome and correct all discrimination against and disadvantage of groups in their societies. Second, because, as we have seen, there are patterns of participation that exist in societies which are embedded in the norms and institutions of the society, every policy undertaken by an MOE to increase schooling for all children will, inevitably, either reinforce existing patterns of advantage and disadvantage or challenge and change them. And, finally, it should be noted that attempts to overcome patterns of unequal access to education by treating all children equally will fail. Experience shows that treating unequals as if they are equal either perpetuates or worsens inequalities. Special, remedial, or focused policies are required to overcome patterns of marginalized access.

These points having been made, let us turn now to look at the policy options which educational planners and implementers face to improve access for all children. We may understand these options by categorizing them into: a) those that affect the supply of schooling, and, b) those that are intended to affect the demand for schooling.

Policy Options to Affect the Supply of Schooling. The most direct tools which policy-makers have for affecting access to schooling are the supply variables, including: building, locating and equipping classrooms; recruiting, training, placing, supervising, and rewarding staff; and developing curricula and educational materials. It is clear from the discussion above, for example, that if remoteness is one factor affecting access to schooling, the provision of classrooms within what is deemed an acceptable travel distance (which may be different for boys and girls) will improve access of those who failed to participate because of distance. Recruitment and reward systems for teachers which encourage them to locate in poor and remote areas will result in a "reaching out" to unreached groups. Policies which reduce the costs of schooling, less need to travel to and from school or provision of transportation, free schooling, free textbooks and materials, etc., will reach children of poorer families. Provision of trained teachers and school facilities for special needs children will improve access for children with certain handicaps.

Where there have been disparities in the supply of schooling to different groups, conscious policies to overcome these supply disparities can lead to more equitable access among all groups of children. There is an obvious problem which these supply policy options present, however. No society has sufficient resources to meet all educational needs. Thus, the reality that policy-makers face is the necessity of making choices and setting priorities among less-than-perfect alternatives. Simply to say that access could be improved by higher spending is, while true, useless to most decision makers.

Useful options for policy-makers under conditions of resource constraints are those which improve the efficiency with which given educational resources are used so that, with little or no increases in costs, more children are served and equity of access is improved. The key to understanding how to supply education so that the most children are served and all children have an equitable opportunity to be served lies in understanding disparities in the demand for education.

Policies Affecting the Demand for Schools. In the discussion of factors that affected access to education above, we noted a number of factors that represented differences in parental demand for schooling for their children. Through understanding these disparities in demand, MOEs can make choices about how to supply education to achieve their dual goal, improved educational access with decreasing educational disparities among groups of children.

As we have seen, parents who perceive education as irrelevant (either to life as it is currently lived or as not improving future prospects) are not apt to send their children to school. Costs, both direct and indirect, affect parents' decisions about whether to send children to school and which of their children to send. Conflicts of schedule of schools with other jobs that parents require of their children can make time spent in school too "costly" as well.

Parents claim that their perceptions about their children's safety as they go to and attend school affects their decisions (more for girls than for boys). They note that ethnicity, religious affiliation, tribal identity, race, and the gender of teachers influence their sense of appropriateness (safety, relevance, or the possibility that the teacher is seen as a role model) of schooling for their children.

Examination of these factors that influence the demand for education differently among different groups suggests some policy options for school decision makers for which additional costs are minimal. For example, in many cases recruitment and placement of teachers can meet the demands of parents that teachers be appropriate for their children with no additional costs. (This is not always true. Where female teachers must be placed in remote and rural schools to overcome demand obstacles of parents, educational systems may have to undertake special expenses of transport, housing or incentive pay to entice and keep female teachers in areas seen as difficult for them.)

While building additional schools always adds to the expenses of schooling systems, choice of location of schools can meet certain parental demand factors without increasing school costs. For example, some routes in village areas are considered safe for girls to take to school; others are not. When curricula are being designed and materials developed, it costs little extra to ensure that they are inclusive of various groups in societies and to ensure their perceived relevance to multicultural or gender differences. School schedules can be changed (especially to fit agricultural labor seasons, but also to fit nomadic seasons) with no additional cost. If separate schooling for girls is seen by parents as increasing their safety, school shifts (one for boys and one for girls) may be introduced in the same classrooms which will both meet the safety requirements for girls, expand opportunities for

everyone, and offer scheduling flexibility which might conflict less with daily household chores of all children.

The list of possible policy choices which would address those demand factors that limit school participation by certain groups is long and well known. Knowledge of the factors which affect access in many countries, and analysis of the special factors which affect parental demand for education in any given context, provide important background for educational policy-makers whose objective it is to increase access and reduce disparities among groups of children in their societies.

However, where research exists about policies which have been implemented to overcome demand disparities described above, findings reflect varying levels of success relative to unintended consequences. Even when the determinants of exclusion from schooling have been well understood, as, for example, poverty, policies designed to reduce the costs of education have, even as they have succeeded in bringing more poor children into school, also at the same time increased disparities in the quality of education received by rich and poor groups. This is because there is a tendency, in every system, for groups who have held positions of advantage vis a vis any resource (education included) to find ways of co-opting any new programs even though these have been designed to improve opportunities for a group that was previously disadvantaged. For this reason, it is always easier to open opportunities to previously excluded groups through specially focused policies while **at the same time** improving opportunities for general access for everyone.

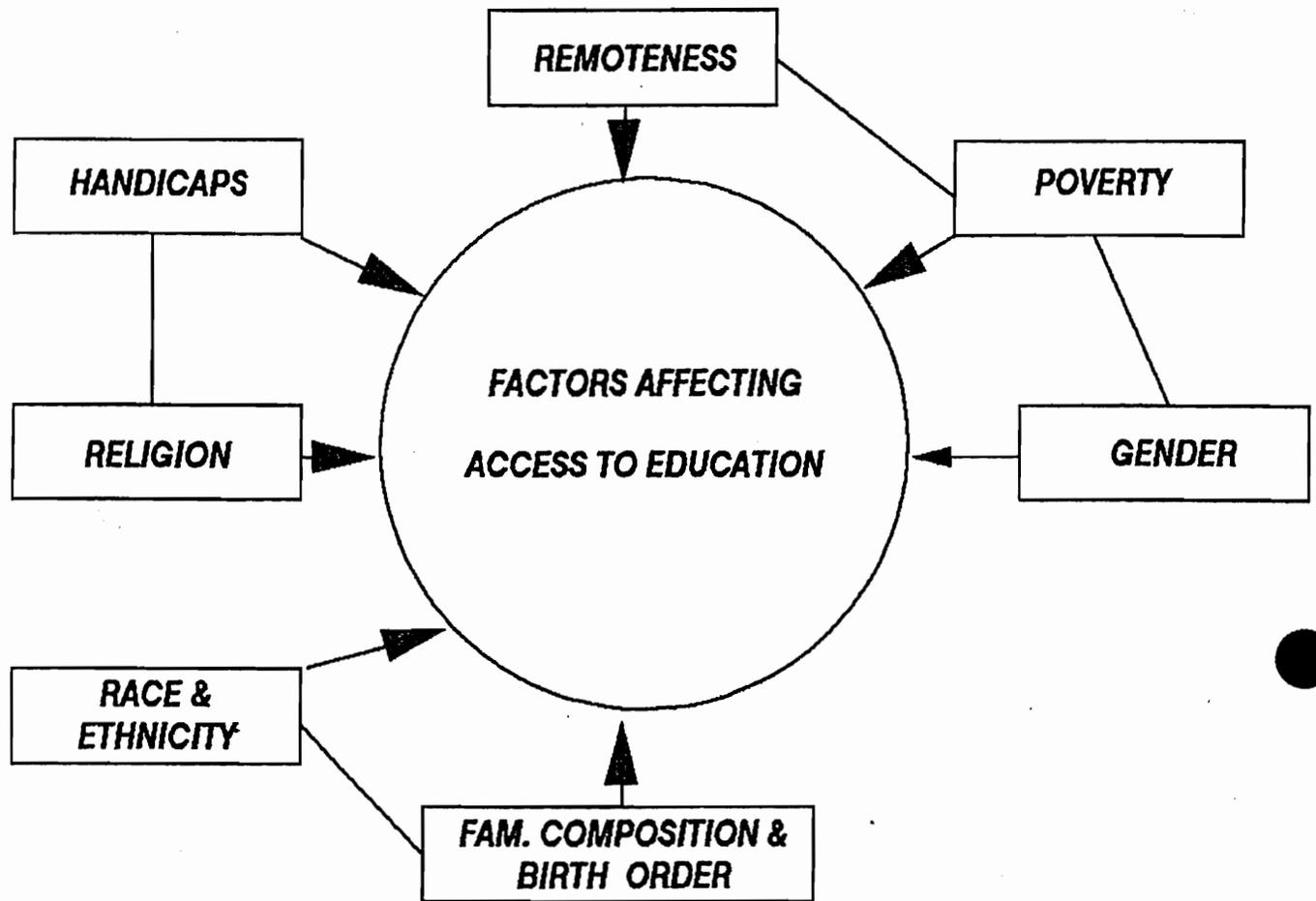
Research has also shown that, very often, there are several overlapping factors (rather than a single factor) which affect parental demand for education for their children. This presents a complication to MOEs attempting to overcome access disparities because, where a policy is introduced which addresses only one factor, results have often been distorted. It is important, then, for Ministries of Education to recognize that attempts to overcome educational disparities require analysis of the real contextually important factors that limit demand among certain groups and, usually, a multipronged policy will be required.

Multipronged does not, however, have to be overly complicated. Policy-makers can identify with a high degree of clarity the specific groups in their societies that are disadvantaged in educational access. They can, again with certainty, predict that these same groups will continue to suffer from differential educational access until some direct effort is made to address the supply and demand factors which prohibit their school participation. Policies can be designed which focus on these specific factors but these are most effective when they are coupled with policies which, at the same time, improve

schooling for those already included (but which close the gaps among groups). Finally, representatives of the disadvantaged groups may be included in the design of policies which will overcome their children's failure to participate, not to identify those factors which keep them from attending school (which by now are well known), but by specifying what actions and programs would convince them to send their children to school.

Fig. One

ACCESS & EQUITY : What are the Issues ?





**"Improving Access to
Schooling in the
Third World:
An Overview"**

Mary B. Anderson

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Basic Research and Implementation in Developing Education Systems

A project of the Harvard Institute for International Development,
the Harvard Graduate School of Education,
and the Office of Education, Bureau for Science and Technology,
United States Agency for International Development

**"Improving Access
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Overview"**

Mary B. Anderson

With research assistance from
Meena Balasubraminiam and
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Prepared for Project BRIDGES
(Basic Research and Implementation in Developing Countries)

Harvard University
Cambridge, MA

Foreword

It is fitting that this first publication in the *BRIDGES Research Report Series* focuses on the issue of determinants of access to education. Later publications will examine problems of the quality of education, with attention to policy options in learning technologies, school organization and management, supervision, teacher training, classroom management practices, and other ways in which learning outcomes can be improved. But for many countries the quantity problem still looms large. Despite heroic efforts, as Mary Anderson points out, some children never enroll in school and many do not finish the first cycle.

At first glance, limited enrollments are strictly a problem of schools and teachers; the supply of education is too limited. Building more schools and training more teachers is the obvious, and obviously costly, response. For the poorest countries this appears to put improvements in access beyond reach. But ultimately the supply of education is a function of demand for it, and not simply a function of a country's income or wealth. Some developing countries have achieved full enrollment (for both boys and girls) with per capita GNP levels less than those of other countries still far from enrolling all their children in 1st grade. In almost all cases universal enrollment has been accomplished by mobilizing local resources to supplement state revenues: family expenditures on public education have in many cases been as large as state expenditures. Although cultural factors have been important, state policies have made teaching a profession that attracted highly qualified and motivated persons. In all of these cases, social demand for education was extremely high, and both state and families were willing to forego other uses of income in order to educate *all* children.

A second approach to expansion of supply has been to look for more cost-effective ways of delivering educational services. These include new methods of training and supervising teachers which can lower the cost per student or increase levels of learning or, in the best of circumstances, both. These "low cost learning methods" have attracted much attention recently,¹ and will be the subject of a future paper in this series.² Other options include distance education methods which appear to be cost-effective (that is, raise levels of learning at a relatively low unit cost) but which do not lower overall costs per student.³

But mere expansion of the total supply of education does not insure that access will improve for all groups in society. For example, an examination⁴ of trends in the ratio of girls to total enrollments indicates that some countries that have expanded overall enrollments rapidly have done so by favoring boys over girls, reducing the proportion of girls in schools.

Furthermore, enrollment rates depend not just on opportunities to enroll, but also retention in school. Completion of each grade in one year is the best guarantee that a child will complete the primary cycle. Dropout rates vary in direct proportion to failure rates, or, in other words, demand for education declines when children experience failure. Dropout rates vary considerably, by gender, urban versus rural, and social class, in some measure because of differences in family demand for education, but also because of differences in the treatment children receive in school as a function of gender, place of residence, or social class. In countries where most children enter school but many drop out, efforts to improve retention can have more impact on the overall enrollment rate than efforts to increase opportunities for enrollment.

These are some of the complex relationships that must be taken into account in choosing among policy options to improve access. Instead of just summarizing the limited findings of research with respect to how different policies affect access, Anderson presents a framework for a program of research that considers the following pairs of interactions:

- policies to increase supply *versus* policies to increase demand;
- policies to increase overall enrollments *versus* policies that increase enrollments of groups currently underrepresented;
- policies to improve opportunities to enroll *versus* policies to increase retention of those who do enroll.

Among the important policy questions that should be considered in this research are the following:

1. Larger schools may be more cost efficient, but result in locating schools further from students, reducing the likelihood of attendance (especially by girls). What is the optimal size for a school in order to balance cost with access of (female) students?
2. Does the physical condition of a school make any

difference to the community it serves? What is the optimal maintenance cost to maximize enrollments?

3. Some countries have had considerable success in mobilizing community resources to purchase school furnishings-how important are furnishings to enrollment and retention of students, and what policies most enhance local support?

4. What is the optimal package of physical facilities (e.g., residence) that will attract (women as) teachers to rural schools (and therefore increase girls' enrollments), while keeping costs down?

5. What is the optimal level of qualifications to attract rural women into teaching while keeping costs down?

6. What is the makeup of the minimal package of instructional materials that should be provided by the state (or supported through other means) in order to insure maximal enrollment and retention of students from poor families?

7. Under what circumstances are school fees a feasible means to mobilize resources that generate increased opportunities for schooling?

8. What is the impact of supervisors and school headmasters on retention of students (and overall learning outcomes)? Could funds currently spent on supervision and school administration be better spent on hiring more teachers?

9. Could access to schooling be increased (or class sizes reduced) by putting all schools on double shifts without significant reduction of learning outcomes?

10. Can more qualified persons be attracted to the teaching profession by offering higher salaries or other financial incentives? Would the expected gains in improved quality compensate for the increased cost and subsequent reduction in supply of schooling?

11. Does the gain in retention that results from a policy of automatic promotion offset the assumed costs that result from reduced quality?

12. Research is inconclusive with respect to the optimal student/teacher ratio; an increase in class size would free resources to staff more schools. How large can class sizes be before there is a significant decline in teacher performance and learning outcomes?

13. Many rural schools have small student/teacher ratios because of low population density. This increases unit costs and limits overall access. What combination of distance education methods would provide the same quality of education, reduce unit costs and increase access?

These are some of the policy issues suggested by a reading of this paper. Existing research on issues of access provides little in the way of definitive recommendations; Anderson makes up for this deficiency by generating a richly suggestive framework for identification of policy options. The door is now open; future issues of this *Series* will deal with specific options to maximize the outcomes of schooling.

Noel F. McGinn
February 22, 1988

FOOTNOTES

¹For example: Cummings, William. "Low-Cost Primary Education: Implementing and Innovation in Six Nation," International Development Research Center, Ottawa, Canada. 1986.

²Pasigna, Aida, and Sivasailam Thaigarajan. "Literature Review on the Soft Technologies of Learning." Project BRIDGES, Harvard University, 1986.

³Anzalone, Stephen. "Using Instructional Hardware for Primary Education in Developing Countries: A Review of the Literature." Project BRIDGES, Harvard University, 1987.

⁴Cuadra, Ernesto. Work in progress for Project BRIDGES, Harvard University, sponsored by the Women and Development Office, U.S. Agency for International Development. 1988.

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Executive Summary

The paper reviews the literature on access to education in Africa, Asia and Latin America. Access is defined to include entry into school, retention in school and quality education.

Two rationales exist for government policies of access: education for all children is valued as a basic right; education is a means to achieving other goals, usually economic and social development and political, national integration.

Although access is basically a problem of insufficient resources, research clearly shows that distinct patterns of access to or exclusion from education exist in most societies. Eight factors that affect differential access are



...research clearly shows that distinct patterns of access to or exclusion from education exist in most societies.

identified. These include: 1) remoteness of residence: rural children consistently have lower educational opportunity than urban children; 2) poverty; 3) gender: girls almost universally receive less schooling than boys; 4) intra-family composition and birth-order; 5) race or ethnicity: groups who are disadvantaged in general in a society due to prejudice, are also disadvantaged in terms of educational access; 6) religion: norms and val-

ues can be used to determine exclusion of some groups from schooling; 7) handicaps: sometimes societies "excuse" children with physical or mental handicaps from school; and 8) children in motion: it is difficult for school systems to supply stable schooling to nomads and refugees as they travel or take up temporary residence.

Policies that address access issues can focus either on increasing the supply of education or on changing the effective demand for education. The paper describes policy attempts to overcome access problems via case studies of their impacts. The research shows that when policies focus on a single factor affecting the demand for education, some improvement may result in access but often brings unintended consequences that reinforce existing patterns of access and exclusion.

Three guides for policy makers emerge from the review. First, the fact that patterns of demand differ among different groups in societies as a result of historical/economic forces is noted. Second, research in Egypt suggests that patterns of demand are repeated from generation to generation so that, once having identified the groups who do not send their children to school, policy makers can focus their efforts on these groups rather than having to consider all possible determinants of access. Third, when policies are developed to improve access, they should take into account the interaction of factors that cause families to keep their children away from school or to enroll them. Policies which focus on single determinants of demand, even where these are clearly important, often fail.

Suggestions for future research include conducting case histories of successful and less successful policy initiatives as well as studies that directly involve the very groups who have been excluded in order to determine why they have kept away from school. Also, systematic comparative studies of policies undertaken to improve access are called for.

Section I: Introduction

Among the principal goals of educational policy in the countries of Africa, Asia, and Latin America, improving and extending access to education is one of the most universally accepted. From the 1960's to the present, the provision of schooling has markedly increased. But, while both absolute numbers and overall percentages of children in school have risen, the number of children not in school remains high and, in some instances, has also risen.

Definition of Access

Access to education has two basic dimensions: opportunity and participation. The first dimension, opportunity, refers to the supply of educational resources such as schools, instructional materials, and teachers. Limited educational access often results from limited educational resources. When this is the case, educational policy-makers try to supply the greatest educational product for the lowest possible cost. This means that difficult choices must be made among educational priorities and alternative means of pursuing these priorities explored. However, experience shows that educational policy choices often have differential impact on children, improving opportunities for some while disadvantaging others.

The second dimension of access, participation in educational opportunities, refers to the effective demand for education when education is available. Educational demand is often determined by cultural, family, and individual factors which can facilitate or inhibit initial enrollment and/or continuation in school. Both the initial enrollment and retention of the student in school are aspects of this dimension of access. Cross-system comparisons of educational access reveal different patterns of access and retention among wealthy/poor, male/female, and urban/rural children.

Purpose of Paper

Access to education is important because of its relationship to both economic development and social equality and justice. We shall examine access studies of interest to policy makers who face the choices and issues raised by limited economic resources and who are concerned about differential policy impacts. The purpose is to identify the variables that educational policy makers can manipulate to achieve desired outcomes in

access and retention levels and to specify the determinants and contextual conditions that support or impede the achievement of these outcomes.

Structure of Paper

The research literature on access and retention in education falls into three groups. First, there is a body of literature that deals with the purposes of education and the associated justifications for increasing access to education. In general, research in this area is not definitive. There are many areas of conflicting findings resulting in little certainty about the justifications for increasing educational opportunities. This is discussed more fully under Section II: Educational Goals and Access.

The second area of literature addresses the opportunity and participation dimensions of educational access. It specifically identifies and analyzes the patterns of access to and exclusion from educational systems. This body of literature is extremely rich, and helps to identify and clarify these patterns, their causes and possible solutions. This will be discussed in Section III: Factors Influencing Access.

The third area of research describes and evaluates policies and programs designed to increase access and improve retention in schooling systems. These studies are helpful in identifying the possibilities and pitfalls of different approaches to improving access. This literature is not comprehensive because only a few initiatives have been carefully analyzed and published reports on them are few. There is a real need for a systematic and comparative review of policies to increase access. The existing literature is discussed in Section IV and deals with the design and implementation of policies to improve access. Section V concludes the paper with a brief overview of the discussion and a perspective on further work in the area of access.

While both absolute and overall percentages of children in school have risen, the number of children not in school ...has also risen.



Section II: Educational Goals and Access

In Africa, Asia, and Latin America, virtually every Ministry of Education has a declared policy commitment to providing universal access to education to all citizens, regardless of wealth, location, age, sex, religion or ethnic group (Malakpa, 1986; UNESCO, *Fourth Consultation*, 1985). These commitments usually have a number of components: 1) to extend access (increase the number of places in school, particularly to as yet unreached groups); 2) to equalize access (adopt non-discriminatory approaches to rationing existing places among children of all groups); 3) to improve and equalize the quality of education among schools; 4) to improve and equalize retention rates and the opportunity for promotion within the educational system for all groups; and 5) to improve and equalize the chances for successful employment after school.

Rationales for Access Policies

Governments adopt policies to expand and equalize access to education with two distinct purposes in mind. First, they see education as a goal, in and of itself, either as a basic human right or as a benefit resulting from development. From an individual's viewpoint, education is expected to lead to other benefits such as advancement in society at large. Education is one aspect of a good life, to be guaranteed to all citizens as a right (UNESCO, *Fourth Consultation*, 1985). The wealthier the society, the more of its citizens it can afford to educate.

Second, policy makers see education as a means to achieving other goals, including development and national integration and identity (Lynch, 1986, p.8). A better educated citizenry is thought to be economically more productive and politically more stable (Adelman and Morris, 1973) so that investments in education are seen to "pay off" in terms of increasing development and national stability.



Which investment is better: to provide a little education to all of the people,...or higher education to fewer?

Implications for Access

The policies and approaches chosen for extending access to education as a right sometimes differ from those chosen to improve access to education as a means toward further development. When education for its own sake is the goal, resources are used to realize the greatest educational return in terms of the internal efficiency and/or effectiveness of schools. When education is intended to achieve other developmental goals, the choices among different types of educational inputs require more precise knowledge about which education, and of whom, will produce the desired results.

Both of these approaches have important implications for questions of access-i.e., who receives education in the society, how much and of what type (academic vs. vocational) and quality? Which is the better investment: to provide a little education to all of the people, to provide more education to most of the people, or to provide higher quality education to fewer, but more strategically placed people?

A great deal of research has been done on these issues. Examination of this research, however, produces no certainty for educational policy makers in developing countries about the causal direction, magnitude or immediacy of the relationships between education and development.

Access Literature and Educational Goals

The research literature on access as it relates to educational goals, can be divided into two groups reflecting the two basic purposes of government policies to improve access. The perspective of education as a goal, in and of itself, to be made available to all people as a matter of social justice often links access and equity as a single concept. Articles written from this perspective focus on the interactions between economic and political inequality and education. Models detailing how socio-economic status determines access to education or how educational attainment determines social and economic achievement and status reflect this perspective (Heyneman, 1983; Court, 1975; Weis, 1979; Oxenham, 1984; Ginsburg and Arias-Godinez, 1984; CERID, 1984; Singh, n.d.; King, 1981; Brenner, 1982).

The second perspective in the literature focuses on education as a resource for development. Writers in this group usually rely on human capital analysis to justify the extension of education to previously excluded groups because it can be demonstrated that education is a good investment with favorable rates of return. Human capital analysis is carried out from two perspectives: a) that of the individual or family that justifies the expense on education in terms of expected increases in lifetime income; and b) that of the society that justifies public expenditures on education in terms of expected increases in productivity and/or social benefits gained from an educated population (Adams, 1980; Monchar, 1981; Dixon, 1975; Ram, 1979; Kelly, 1986; Walters, 1981; Lockheed, Jamison and Lau, 1980; Behrman and Bird-sall, 1983; World Bank, *Strategies*, 1985; LeVine, 1980). The latter approach often justifies education as the means to support national identity and unity as well (Bray and Cooper, 1970; Barnes, 1982; Bowles, 1971).

Access Literature

Writers in both groups attempt to justify the expansion of access to education in the terms they propose; either by referring to the impact of expanded education on overall social and political equality, or by showing how expanded access leads to a more productive population. However, the research results are not definitive. For every article demonstrating that education provides an avenue for advancement for poorer people in society (Heyneman, 1983, p.409 for example), others show that this is not the case. For example, some research shows that educational systems reproduce and reinforce the structures and inequities of the societies they serve (Oxenham, 1984; Weis, 1979; Smith and Cheung, 1982). Others show that family socio-economic status is an exceedingly important, and sometimes the single most important, determinant of access to education in terms of entry, retention and quality, thus reinforcing a cycle of educational access (or lack of it) from generation to generation (CERID, 1984, p.92; Brenner, 1982; Smith and Cheung, 1981; Singh, n.d.; King, 1981).

Other studies challenge the effectiveness of education in improving social mobility and social equity in other ways. Some show that, as access to education is expanded, it becomes increasingly necessary for individuals to attain more and more education in order to get the jobs they previously could have gotten with less. The poor cannot use education to advance because the very act of increasing educational opportunity to the poor "has the effect of lengthening the obstacle course of education and favoring those best able to sustain a longer or more costly race. . . . (in other words) the well off and the well connected." (Hirsch, 1978, p.50).

There is also disagreement regarding the role of public subsidies to education as these may reduce or exacerbate inequality in societies. Psacharopoulos (1982) finds that such subsidies to higher education have increased inequality while Ram (1982) disputes the magnitudes of Psacharopoulos' findings. Ram finds that public support of primary education has had an extremely important equalizing effect, while support to secondary education has been extremely disequalizing, and support to tertiary education has been somewhat disequalizing—but less so than Psacharopoulos estimates.

Similarly, studies that deal with the causes of school achievement, important for retention in that school achievement at each level determines who goes on to the next level, also produce different and conflicting results. Some show that home background variables are the principal influences on school achievement, while others show that school-based factors are more important (Toomey and Heyneman cited in Niles, 1981, pp.419 ff.; also World Bank, *Brief*, 1985). Niles attempts to reconcile these conflicting findings by introducing a number of possible explanations for the variance. These include such things as the extent or range of difference among families of different socioeconomic levels, the degree of closeness or discontinuity between homes and schools in different societies, urban and rural differences, etc. (Niles, 1981, pp. 427-8). However, because such "explanations" introduce an almost unlimited number

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of contextual variables they are context specific. It is, of course, necessary to determine which variables are critical in any specific context. But this very necessity renders it difficult if not impossible to make generalizable results upon which to predict educational impacts.

Studies that attempt to justify the extension of access to education to higher levels (Psacharopoulos, 1982), or to new populations (Noor, 1981), on the basis of favorable rates of return also are contradicted by other studies which show that such rates of return fall rapidly as the expansion of education proceeds (Loehr and

The answer depends as much on one's vision of the desired society,... as it does on scientific research findings...

Powelson, 1981; Hirsch, 1978). Nonetheless, there is a sizable literature that shows positive correlations between educational attainment and other desired outcomes such as increased earnings (e.g., referred to in Behrman and Birdsall, 1983) and productivity (World Bank, *Strategies*, 1986). Others show that educational attainment of women is positively related to reduced fertility, improved family health, and attributes of mothering (LeVine, 1980; World Bank, *Strategies*, 1985; Dixon, 1975; Kelly, 1986; etc.).

Concluding Comments

In sum, the studies that attempt to relate education to social equity seem, on the whole, to show that education does not necessarily lead to expected improvements in all social settings. The studies that attempt to relate education to economic and other social outcomes seem, on balance, to find evidence that the correlations are positive. However, the number of variables to be considered and the variations among societies make it difficult to "prove" that one or another policy for extending educational access *always* results in predictable outcomes. Differences in levels of development, cultural characteristics, and educational histories (including education under colonialism), affect the level of social equality, economic productivity, or national cohesion produced by a particular policy.

It is not surprising that the access literature cannot agree on the outcomes of various educational investments. Embedded in this issue is the classic and unre-

solved development question of the relationship between growth and equity. Will expanded and equal access to education increase overall productivity faster and more effectively than concentrated educational investments? The answer depends as much on one's vision of the desired society, and beliefs about which trade-offs are acceptable and which are not to attain the desired society, as it does on scientific research findings derived from studies of other countries. Educational policy makers balance the provision of education as a benefit of and as a means to development in different ways, depending on their countries' strategies for development.³

Whatever the research findings, governments will (and undoubtedly should) continue to adopt policies designed to increase access to education, reduce wastage, and improve overall quality. They will do so both because they believe that there is a direct relationship between educational attainment and development, as well as because they feel it is "right." It even appears that the real purpose served by the research efforts that justify expanded access as it relates to another goal, is to provide the arguments that policy makers need to defend educational policies already enacted for political and ethical reasons.

³Court's comparison of the attempts of Kenya and Tanzania to design educational policies to overcome inequalities in their systems is an example of this type of balancing. (Court, 1975.)

Section III: Factors Influencing Access

How well do the governments of Africa, Asia, and Latin America achieve their goals of universal and equal access to primary education? What is their record in terms of improving retention rates for all groups in their societies? How well do they provide access to secondary and tertiary education?

In general the developing countries have made significant strides in providing schooling to their children. Between 1960 and 1985, enrollment rates for children between 6 and 11 years of age went from 32.7% to 65.9% in Africa, from 54.4% to 73.6% in Asia and from 57.7% to 83.5% in Latin America and the Caribbean (The Hunger Project, 1986, p.4). In all cases, access to primary education is far more extensive than to higher levels and, with the exception of primary school levels in Latin America, in all circumstances girls lag behind boys in access.

The collection of data on educational access over the past decades is extensive and shows a general increase in all countries. It also shows that governments have not yet achieved their stated goals of universal and equitable access for all groups. Certain patterns of disadvantage appear as virtually universal. To analyze and understand the reasons that governments have not met their educational access and retention goals, it is necessary to make several important distinctions. These are: between general and differential access and retention; between "visible" and "invisible" patterns of access and retention; and between access and retention patterns that arise from insufficient or inefficiently used resources (supply-side) and those that result from differences in the demand for education. These will be discussed below as influences on the opportunity for access and participation in education.

Factors Influencing Opportunity

When governments make their goal the education of all children, but the number of places in schools (or the number of teachers, or supplies) simply do not match the numbers of school-aged children, then the problem is clear and visible to policy makers. It is simply one of insufficient resources.

Solutions, however, are less simple. One may increase the allocations to education and bring the supply of

schooling into line with the need. Given the national budgets of most African, Asian, and Latin American countries, however, this "solution" is unrealistic. Therefore, solutions must be found in policies and programs that increase the efficiency of existing resources. Such policies may extend and improve education without additional costs or they may allocate limited resources among educational priorities in ways that serve both educational and developmental goals effectively and are, at the same time, perceived to be fair.

Increasing Efficiency

Increasing the efficiency of resources may entail the development of new approaches. Teachers may receive lower cost training. Schools may be put on double shifts. New learning technologies may be developed. More efficient management systems may be devised. The experiments and experiences to expand both the quantity and quality of education without increasing costs are many. Although discussion of these lies outside the scope of this review, they are discussed in other papers in this series (see *Bridges Research Report Series*).

In all cases, access to primary education is far more extensive than to higher levels and, with the exception of primary school levels in Latin America, in all circumstances girls lag behind boys.



Access Implications of Limited Resources

Allocating limited educational resources efficiently and fairly among those of school age also entails choosing alternatives. Policy makers set priorities according to the educational and developmental goals they pursue and allocate resources accordingly. They set priorities among levels, locations, and types of education to be provided. By definition, some children will receive more and some less through the setting of these priorities.

A study...in Nepal found that for every kilometer a child had to walk to school, the possibility of that child attending school dropped 2.5%.

In addition, educational planners are forced to face increased demand for education at higher levels in a later period. If, for example, they choose to concentrate resources on schooling at the primary level, they soon face a demand for expanded opportunities in secondary, then tertiary, education. The relative unit cost structure of the three levels has been estimated by Psacharopoulos (1982, p. 154) to be 1:4:16 for developing countries. Thus, expansion of primary education may be seen as a relatively "cheap" policy but, as successful completers seek promotion to higher levels, the increasing cost implications are serious.

Because of limited resources it is necessary to ration the available spaces in secondary and tertiary institutions among the many who want them. Education systems must establish both efficient and equitable ways to do this rationing. System-wide examinations are usually used. For the rationing system in higher levels to be *perceived* by the population as equitable, it is necessary that all children should have an equal chance at success (Court, 1975, p.27). Thus, the issue of the relative quality of education received in various schools arises. Those whose primary schooling has been of superior quality tend to move ahead because they perform best on qualifying and promotion examinations.

Experience shows that no educational system has successfully equalized quality across all schools. Some (Sri Lanka for example) introduce examinations at earlier grade levels and use the results to prompt transfers of qualified children to better schools. While this policy gives all children an opportunity to gain entry to a quality school, it reinforces the inequalities among schools as it siphons the best students away from poor schools and concentrates them in the better ones. Because the best teachers and principals are sometimes also "rewarded" by promotion to the best schools, the disparity in quality among schools is further reinforced.

The intent of these efforts to use limited resources more efficiently or to equalize opportunity for education is to extend educational opportunities to the people in general. Each activity may have unpredicted consequences in terms of their impact on different groups within the society.

Factors Influencing Participation

While educational policies are generally devised to affect the total education system, evidence indicates that certain groups in virtually all societies are disadvantaged in terms of both access to education and the opportunity to complete the various levels of education. In some cases, disadvantage is due to insufficient resources. In other cases, differential impact is a result of educational

policies that are embedded in social/economic/political relationships and interactions in the society. Because of their embeddedness, these relationships have been "invisible" to policy makers.

The literature on educational access and retention is extremely helpful in identifying eight factors which determine differential access and retention. As will become clear from the discussion below, these often overlap, compounding the problems of access for certain groups.

Remoteness

The first factor that limits access to education is remoteness. Data clearly show that, in all systems, rural children's opportunity for schooling lags behind that of urban children (CERID, 1984; ICED, 1974; Court, 1975; Robinson, et al., 1986; CERID, 1983).

Schools have generally been built first in cities and towns where the population density is greatest so that the most children are served. Only then have they been built in the hinterland. Sometimes the priority placed on urban schooling reflects the political pressures applied by urban populations on education ministries while rural populations (who are also often poor) have less political influence. Even where schools are built in rural areas, the fact that populations are dispersed means that rural children usually have further to travel to their schools than urban children.

A report prepared by the International Council for Educational Development (ICDE) for UNICEF in 1974 on new strategies for serving rural children lists five impediments to education in rural areas. These are: 1) a general lack of resources including teachers, materials, facilities, and equipment; 2) a lack of reinforcement for education in the local environment; 3) language problems when the curriculum is in a national (and usually urban) language while rural areas retain use of other languages; 4) a standardized curriculum established centrally that is irrelevant to rural life; and 5) the household and production chores of children in rural areas that compete with the school schedule (ICED, 1974). Other studies show that topography can impede school attendance as well (CERID, 1984, p.165).

A study of factors determining educational participation in rural Nepal found that for every kilometer of distance that a child had to walk to school, the possibility of that child's attending school dropped by 2.5% (CERID, 1984, p.176). Another study in Egypt showed that the critical distance that affected school participation was between 1 and 1.5 km. If a school were 1 km. away, 94% of boys and 72% of girls enrolled; if a school were 2 km. away, 90% of boys and 64% of girls enrolled (Robinson, et al., 1986, p.A-59). Other studies show

Of every 100 girls (born to poor, rural parents)...only 5 will complete the 4th year of primary school.

that distance affects girls more than boys and younger children more than older children (CERID, 1984, pp. 140, 177).

Generally in rural areas, girls born to poor parents are in the worst educational position. Of every 100 girls in these circumstances only 5 will complete the 4th year of primary school (Adams, Nov. 1980, p.vi). The International Council for Educational Development estimates that fewer than one-half of rural children in most countries and as few as 10% in many countries complete four or more grades in school (ICED, 1974). Evans (1981) quotes reports that urban enrollment rates exceed rural rates by as much as 20 to 100%.

Poverty

The second general factor in limited access is poverty. Poverty often goes hand in hand with limited educational attainment and low occupational status of parents. In all countries, children of poorer families are less apt to attend or complete school than children of families who are better off (Robinson, et al., 1986; Singh, n.d.; Waweru, 1982; Clark, 1981; King, 1981; Mook and Leslie, 1985; Adams, Oct. 1980; Brenner, 1982; Smith and Cheung, 1981).

- **Family Wealth and Educational Attainment:** One study of families in India and Nepal found that in the richest 10%, rates of enrollment exceed those of the poorest 10% by 50 to 100% (and that the rates are 3 to 5 times higher for males than for females in these circumstances) (Evans, 1981, p.236). Another study in the Philippines found the father's level of schooling to be the single most important determinant of rural children's school participation (Smith and Cheung, 1981), while another (King, 1981) found that the mother's education and the father's wage were critical determinants. In Liberia, parents' wealth and attitude toward schooling were found to be very strong determinants of school attendance for children below age 14; after 14, children apparently more often made the decisions about school participation for themselves (Brenner, 1982). For poor families in Egypt, the cost of schooling is the reason most often cited by parents for failure to send their children to school; as wealth increases, the reasons switch to the perceived irrelevance of the education and distance from school (Robinson, et al., 1986). In Nepal, educational attainment of parents, correlated with income level and attitudes toward education were found to be the most important determinants of non-participation in schooling (CERID, 1984; Lockheed and Jamison, 1979).

- **Poverty and Educational Cost:** Families pay for the education of their children in two ways. First, they make direct outlays for school fees, supplies, uniforms, etc. Second, they incur indirect or opportunity costs in

the form of foregone household labor or earned income of a child in school. For poor families either or both types of costs may be prohibitive. In some cases, families decide to educate some, but not all, of their children because of costs.

Even when schooling is ostensibly "free," there are often direct expenses involved. Research shows that such expenses, in the form of activities fees, examination fees, uniforms, paper and pens (if not textbooks), transport, lunches, gifts expected by teachers, furnishings for rooms in boarding schools, etc., often result in the exclusion of poorer children from school (Nkinyangi, 1982; Tilak and Varghesa, 1985).

Other education costs are hidden. For example, to increase the chances for getting into higher grades, parents hire private tutoring for their children; children of families who cannot afford this extra instruction are disadvantaged at times of promotion (G.B. Gunawardena, personal communication).

For families to decide to bear the costs of educating their child(ren), they must perceive that the returns from education will make the expenditure worth it either in terms of increased future income, increased overall household productivity (because the educated family member(s) provides access to other resources such as credit, understanding of the correct use of fertilizers and pesticides, etc.), or in prestige (Baramki, 1986). Sometimes, families educate only one of their children in order to have one family member who can read, write, and deal with the educated world of lawyers, tax collectors, and government functionaries (Ashby, 1985).

- **Poverty and Child Labor:** Many studies have found that the necessity for children to perform economically important tasks that support household survival limits school participation (CERID, 1984; Smith and Cheung, 1981; Chamie, 1983; etc.). This is more often a problem for rural children than for urban, with the possible exception of urban squatter groups where the income earning activities of all family members are important for family survival. One study (Clark, 1981) of time use by children in and out of school in Guatemala found the necessity to work explains non-participation in school for older boys but does not alone account for non-participation in school for other children. In the Philippines, 15% of male and 9% of female children in rural areas are in the paid labor force by necessity and cannot attend school. In addition, some 63% of rural children are involved in unpaid agricultural labor for their families to the detriment of their school participation (King, 1981, p.1).

- **Poverty and Academic Performance:** Poverty also negatively affects children's performance in school. Malnourished children perform less well than their better

...it costs more to provide schooling in rural areas...because of the necessity for incentive pay for teachers...

off peers (King, 1981; CERID, 1984; Mook and Leslie, 1985; Jamison also cites research in Guatemala that shows a similar result; Jamison, 1981).

When families depend on the labor of children for survival, the time required for work reduces the time available for academic study. When the children do go to school they often have a great deal of work to do when they return home in the evenings and, therefore have no time to do homework. The lack of academic study time is reflected in lower academic performance.

• **Poverty and Remoteness:** Poverty and remoteness are usually linked, as income levels in rural areas are almost uniformly below those of urban areas. One reason it costs more to provide schooling in rural areas is because of the frequent necessity of providing incentive pay to get teachers to accept service in remote areas. Also, the distribution of supplies and equipment to remote areas costs more. If any of these costs of education are borne privately rather than being subsidized through public funds, then the per capita costs of education to rural poor families can be higher than to wealthier urban families. Thus, both direct educational costs and opportunity costs are higher in rural areas than in urban areas.

• **Poverty and Retention:** Poverty also affects retention in school. Parents who send a child to primary school, sometimes cannot or will not bear the increased opportunity cost of continued schooling when the child is older and more productive in the family (CERID, 1984, p.140; King, 1981, p.20).

Low educational attainment and poverty often go together, since children from poorer, less educated families do not receive parental encouragement for schooling (Bowman and Anderson, 1980, p.26). In all cases where poverty and wealth influence who can enter and continue in school, the influence is a demand side influence. Families determine whether or not to send their children to school based on their perceptions of the relevance of and likely returns from education. For all of these reasons, children from poorer families are more apt to drop out of school than children of better off families.

Gender

The third determining factor of differential access to and retention in schooling is gender, with entry, participation and completion rates of girls in general being lower than those for boys. UNESCO gives the following enrollment ratios for 1960 and 1975 by age and sex:

Continent	Age 6-11		Age 12-17		Age 18-23	
	M	F	M	F	M	F
Africa						
1960	41	25	23	11	3	1
1975	59	43	39	24	8	3

Continent	Age 6-11		Age 12-17		Age 18-23	
	M	F	M	F	M	F
South Asia						
1960	60	35	27	12	5	2
1975	71	50	38	22	10	4
Latin America						
1960	59	58	39	34	8	5
1975	78	78	58	54	22	18

Quoted in Bowman and Anderson, 1980, p.11.

The overall improvements in access to schooling are impressive, but it is clear that certain areas lag consistently behind others. By 1980, Kelly (1986, p.5) reports that the male/female enrollment rates were as follows:

- for ages 6-11: in Africa, 69% for males and 56.5% for females; in Asia 77.4% for males and 59.3% for females; in Latin America about the same for males and females.
- for ages 12-17: in Africa, 44.1% for males and 30% for females; in Asia 43% for males and 29.7% for females; and in Latin America, 65.4% for males and 62.7% for females.

While the enrollments of girls have increased and, in most countries, gained relative to boys, girls are still disadvantaged in education. Whereas their enrollments in schools at all levels increased 300 million between 1950 and 1985, the number of girls not in school also increased by 100 million in this period. While one-fourth of all school aged children in the developing countries are not in school, about 40% of primary age girls and almost 60% of girls 15 to 19 are out of school (Sivard, 1985, p.18). A report prepared for the midpoint conference of the U.N. Decade for Women, in 1980, found that in Afghanistan, Bhutan, and Nepal, fewer than 20% of their girls were enrolled in primary school (Adams, Nov. 1980, p.xi).

Goldstone (1986) introduces a measure of sex disparity which is measured as the gross female primary enrollment ratio in relation to the gross male primary enrollment ratio; zero indicates parity, (one minus the ratio of females to males: 1-f/m). His measure, when applied to international data indicates improvement in the disparity rate between 1960 and 1980-83. The number of countries with a sex disparity in education greater than 75 dropped from 12 to 1 and the number of countries with a sex disparity of 25 or less rose from 45 to 65. Ten countries showed consistent improvement over this period while 14 showed consistent deterioration (seven in Sub-Saharan Africa) (Goldstone, 1986, p.6).

In addition, females do not enjoy the same benefits from the schooling they attain as do males (Finn et al., 1980; Sivard, 1985). Studies show that female attendance

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are out of school.

at school is more sensitive than that of males to the distance from schools (Kelly, 1986; Islam, 1979), the father's educational attainment, and the number of children in the household under five years of age (Cochrane and Jamison, 1981). In Egypt, though the majority of families send all their children to school, the discrimination that continues to exist is against female education. Of urban families, 16% send only boys to school and, of rural families, 26% only educate their boys (Robinson, et al., 1986). Girls are more often malnourished than boys and, hence, suffer more in terms of poor school performance (Adams, Oct. 1980, p. 12). There is evidence that both fathers and mothers prefer education for their sons over their daughters (Lewis, 1979).

In Botswana, though girls attend primary school at rates higher than boys, by secondary school they are overtaken by boys and by university level males outnumber females 2 to 1 (Brown, n.d.). The increasing underrepresentation of girls at successively higher levels of education is found in many countries. Data from the Philippines and Chile, however, go against the general trend, showing that, in these two countries, there is a higher ratio of girls completing four years of college than of boys (King, 1981; Schiefelbein and Farrell, 1980). However, another study in the Philippines shows that this is a class differentiated phenomenon. Birthplace (urban/rural), educational attainment of fathers, and poverty all contribute to fewer girls receiving education than boys (Smith and Cheung, 1981). Another study of adolescent girls in developing countries (Safilios-Rothschild, 1982), finds that urban girls in a number of Latin American countries have higher literacy rates than boys overall; but the importance of this finding is in the fact that urban girls have much better chances for education than do rural girls. Thus, the determinant of gender is compounded by the determinants of remoteness and poverty discussed above.

The research literature on women in developing countries has increased dramatically since the 1974 Percy Amendment to the Foreign Assistance Act that required that all U.S. AID projects assess their impact on and inclusion of women, and since the U.N. declared 1975-1985 the Decade for Women. Finn (1978) and Ram (1979) both cite bibliographies of over 200 items each that deal with female education. A number of other shorter bibliographies exist, as for example in Kelly and Lulat (1980), Bowman and Anderson (1980), and Kelly (1986). Here we shall simply summarize from some of this literature the ways in which gender has been found to affect access to and retention in schooling around the world.

Obstacles to female education arise both from outside and from within the education system, and include cul-

tural attitudes and expectations (sometimes religiously based), the perceived irrelevance of female education to economic activity, and educational methods utilized within the schools (Tinker and Bramsen, 1975). The disadvantage of girls in education is mediated through gender-based divisions of labor and social roles.

• **Cultural Attitudes and Social Roles:** Cultural tradition about the social roles of females often affects girls' access to education and their ability to continue to higher levels (White and Hastuti, 1980, for example). In countries where the restrictions of purdah are practiced, girls have low mobility and/or opportunity to attend public events, including school (Islam, 1979), though in some places these limitations are beginning to change (Youssef, 1976). Girls often experience restrictions on their mobility for reasons less explicit than purdah. Such limitations affect access to schooling in very much the same way as remoteness.

Mobility restrictions in many societies arise when girls reach puberty (Robinson, et al., 1986). Therefore, the effect is on girls' retention in school more than on entry. When their daughters reach puberty, parents worry about "protecting" them sexually. In fact, evidence from Botswana, Ghana, and Liberia shows that high drop out rates among high school girls are often the result of pregnancy (Brenner, 1982; Brown, n.d.; Adams, July 1980). In Ghana, 37.8% of the girls who left school cited pregnancy as the reason (Adams, July 1980, p.8); in Liberia 65% of female high school dropouts left because of pregnancy (Brenner, p.5, 1982).

Early marriage more often interrupts schooling of girls than of boys (Bowman and Anderson, 1980, p.19; Safilios-Rothschild, 1979), but studies show that there are probably common causes for early marriage and low school attendance rather than the former being the cause of the latter. In some cases, a fear of "moral corruption" more than of sexual danger underlies parental decisions to withdraw older girls from school (Yates, quoted in Bowman and Anderson, 1980 p. 19; also Beauthac, 1971). That is, parents fear that their daughters will become "modern," and will not obey them or their husbands if they get too much education.

• **Education for Females and Their Economic Roles:** In all societies, there is a gender-based division of labor in both the production of goods and services and in household-based production (Overholt, et al., 1985). This division of labor affects access to schooling in two ways. First, jobs assigned to girls or boys may directly conflict with school attendance. The literature provides numerous examples of limitations imposed on both girls and boys because of other work (McSweeney and Freedman, 1980; Chaimie, 1983; Lockheed and Jamison,

Girls are more often malnourished than boys, and hence, suffer more in terms of poor school performance.

1979; Saflios-Rothschild, 1979; Kelly, 1986; The Foundation for Research on Educational Planning and Development, 1983; Robinson, et al., 1986, etc.). For example, girls often are required at home to care for other children or a great part of their day is consumed in fetching water and firewood (Safilios-Rothschild, 1979; Chaimie, 1983; Lockheed and Jamison, 1979; and many others). In other cases, boys' tasks limit their school attendance; for instance, when they enter the labor market to earn family income (as in rural Philippines, King, 1981), or when they have the job of herding family animals and are, thus, living a nomadic existence much of the school year (as in Botswana, Brown, n.d.).

Job conflicts with schooling more often prohibit girls' attendance in school than boys' because female tasks, located in the household, occur daily (water and fuelwood collection, child care, for example). Boys' jobs are more often seasonal, associated with agricultural production (as, for example, scaring birds and monkeys from ripening crops in Uganda, Anderson, PACT 1986). There are, of course, seasons of high labor requirement in rural areas, such as planting and harvesting, that require the labor of both boys and girls so that neither can attend school.

While parents may be willing to send small girls to school for a while, economic necessity affects girls' retention rates. In Egypt, the major reason given for boys dropping out of school, across all economic levels, is failed examinations, but the major reason for girls in all but the most affluent homes is the cost of education and/or the need for their labor at home. For girls of affluent homes, reasons for dropping out include custom, the chance to marry, and distance to school (Robinson, et al., 1986, p.A-84).

Second, the prospects for lifelong economic activity affect girls' and boys' schooling differently. Since education is often thought to be most useful in the formal economic sector, and because girls/women often have less access to this sector than boys/men, parents decide that schooling is not relevant for the economic roles of their female children (Chaimie, 1983). Ram shows that occupational segregation by gender greatly affects education decisions for males and females as they train for the jobs they expect they will be allowed to fill (1979, p.48).

When parents do not believe that the education of their daughters will result in economic returns, they do not invest in educating their daughters. In addition to low expectations about future employment, parents decide that education is "not worth it" for daughters who, when they marry, will move into their husband's family. They know that any gains in productivity or income due to

education will accrue to the family of marriage rather than to them (Lockheed and Jamison, 1979). In some instances, however, a girl's chances of marriage are improved, or her bride price increased, if she is educated, so that female education can result in sufficient returns to justify the investment (Ram, 1979).

• **Within School Effects on Female Education:** What goes on within schools also affects female access. Teaching methods, staffing, curriculum content, classroom and other facilities are all found to affect female entry and retention in schooling. A number of studies find a positive correlation between the presence of female teachers in schools and the attendance of girls (Safilios-Rothschild, 1979; CERID, 1984; Adams, July 1980). Safilios-Rothschild cautions, however, against assuming that such correlation reflects a causal relationship. She suggests that both the increase in female teachers and the increase in female enrollments may be the result of some other factor. Some studies have shown that the effect of the teacher's gender is even more important in female retention in school through two other mediating influences. First, role-modeling seems in some cases to have an effect on girl students in that, if they perceive that their female teacher has a good life and good options, they are encouraged to pursue higher levels of education. Second, there are studies that show that teacher-student interactions differ by student sex (Finn et. al., 1980), and some show that female teachers provide more encouragement to girl students than male teachers do, by giving them more classroom attention, believing them to be capable, etc. These differences in treatment by teachers are translated into differences in educational achievement (Crandon, 1984).

Other in-school effects on female access include tracking by sex into certain courses. While it is not uncommon for schools to provide some mechanical or shop courses only to males and home economics only to females, there are other courses, such as math and science, that are socially difficult for girls to enter. Further, even when course content appears the same for both boys and girls, a number of studies (quoted in Finn, et al., 1980) shows that there are subtle and important differences in curricular exposure by gender, with girls actually being taught to prepare themselves for marriage and motherhood. These subtle instructional emphases seem, according to these sources, to be correlated to gender differences in educational attainment.

• **Gender and Family Wealth:** One interesting and important relationship between gender and wealth has shown up in several studies and deserves further examination. Parents apparently have greater elasticity of educational demand for education for their girls than

*Discrimination is sometimes explicit
as when schools are designated by
race, ethnicity, or language...*

for their boys. This means that any drop in the costs of schooling will have a greater impact on girls' access than on boys'. Nkinyangi's (1982) study of the impact of the abolition of school fees on different groups in Kenya shows this effect. Another study of the scheduled castes in India (reported by Safilios-Rothschild, 1979) indicates that increases in the size of parental land holdings have twice the impact on girls' educational access as on boys'. Conversely, Islam (1979) finds that one bad harvest for poor families in Bangladesh has a greater percentage impact on the drop in girls' attendance than on boys'.

Intra-Family Composition/Birth Order

The fourth factor determining access to education is family composition combined with birth order and gender. There is evidence from several countries (Nepal, Lockheed and Jamison, 1979 and Ashby, 1985; the Philippines, Smith and Cheung, 1981 and King, 1981; Bangladesh, Islam, 1979) that which child(ren) a family decides to send to school is affected by a number of cultural and intra-family factors. These findings challenge earlier analyses that assumed that family resource allocations would benefit all family members as participants in the production unit. It now appears that there is discrimination and inequality among family members in terms of their access to education.

Ashby (1985) finds that the presence of (and birth order of) other siblings influences who is and is not sent to school and, for girls, it is particularly important whether or not they have brothers. Smith and Cheung (1981) found in the Philippines that poor families with less educated fathers allocated resources for education between sons and daughters less equitably than did better off families. King's findings in the Philippines (1981) show that first-born children are not favored educationally and she cites another study by Birdsall (1980) in Colombia that found that middle children of non-working mothers have less access to schooling than their siblings. Lockheed and Jamison's sample in the Terai Region of Nepal (1979) showed that the more daughters a father had, the more schooling he desired for his sons.

The intra-household factors that have differential effects on the access to schooling of different children in the household are complex and intertwined. Though the evidence from the literature raises intra-family issues as important, it seems unlikely that any single policy can be devised to address the variations among cultures and families. Nonetheless, in any given context, it may be possible for policy makers to identify common patterns among households that would be important in efforts to improve access to education.

Race and Ethnicity

The fifth factor found across societies that affects access to education is race and ethnicity. Groups that, in general, are disadvantaged or disenfranchised because of prejudice also suffer unequal access to education (Wang, 1983; Gunawardena, 1979; Bullivant, 1983). Discrimination is sometimes explicit as when schools are designated by race, ethnicity, or language (when language differs along ethnic group lines). In Nepal, the coincidence of language spoken at home and used in school was found to be a high predictor of school participation. Also, while the ethnicity of the teacher was only the 12th ranked determinant of primary school participation, it was second only to gender in determining secondary school participation (CERID, 1984).

Sometimes the limitation of access to education because of race or ethnicity is more "invisible," embedded in histories of prejudice and discrimination. Examination biases, "mother-tongue" instruction, discrimination in housing and mobility—all can serve to reinforce educational inequalities when the stated educational policy is equality of access.

One interesting study of educational attainment and occupational expectations, done in Malaysia (Wang, 1980), shows that it was the students' awareness that their chances for advanced education and for certain kinds of employment were limited, that affected the decisions of Chinese students not to continue to the sixth form. This resulted in students failing to achieve in school, that is, appearing unable to qualify for higher education, even though all other factors would have predicted that they could have competed ably with their Malay cohorts.

Religion

A sixth determining factor of educational access is, in some societies, religion. Ursula King (1987) traces a relationship between the patterns by which access to holy writings is determined and patterns of access to education in general, particularly focusing on female access, in Hinduism, Buddhism, Judaism, Islam, and Christianity. She notes that the privilege of religious access has often been restricted to certain classes and to males, and she suggests that the patterns set up for the transmission and gaining of religious knowledge (and power) have been influential in setting patterns for access and exclusion to formal, public education. Obiakor (1983) found that the traditional religious leaders in northern Nigeria opposed the universal primary education policies of the government and, through their opposition, were able to undermine the implementation of these policies. King (1987) makes the point, however,

Schooling succeeded...when teachers were recruited from among the same nomadic tribal/ethnic group...

that in many countries and many religious traditions, reformist movements of the nineteenth and twentieth centuries have challenged the religious basis for educational access and exclusion.

The relation among religion, gender, and lack of access in Moslem countries practicing strict purdah is noted by several writers (Islam, 1979; Yousef, 1976; Jones, 1980). The problem for girls' access results more from the need to supply sex-segregated schooling and female teachers than from a devaluation of female education per se. Al-Hariri (1987), however, points out that purdah is not the result of strict religious interpretation, but rather of cultural and traditional norms. She claims that even where purdah is practiced, female disadvantage in education need not occur if the society can afford to provide equal and adequate schools, teachers, texts, transport, etc., as is the case in Saudi Arabia.

Religion, along with gender, social class, and regional location was found, by Yadav (1980), to be an important determinant of access to schooling in India. And Bray (1985) included religion among the factors affecting admission to secondary schools in Papua New Guinea, China, and Tanzania.

Handicaps and Needs for Special Education

Malakpa (1986) finds that even countries that have explicitly stated policies of universal education, "excuse" handicapped students from school attendance where such attendance is "impracticable." Sometimes exclusion of handicapped students from school reflects prejudice against people who are different. Sometimes, the exclusion arises from limited resources where an educational system places priority on improving access for the majority of children before providing special facilities, or teachers, for dealing with special needs.

Malakpa discusses the interaction between poverty, remoteness and handicapped exclusions from schooling. Poorer families are less apt to receive medical services that could prevent or treat certain handicaps. Distance from school may exacerbate difficulties for certain handicapped persons whose mobility is limited. In poor countries, the problem of exclusion from schooling for handicapped children is significant. Without education, the probability that these children can become economically productive is low, but per capita costs of providing education to children with certain handicaps is high for countries in which the educational resources are already insufficient.

Children in Motion

While the literature does not categorize a disadvantaged group as "children in motion," the classification arises from a review of the (scant) literature on nomad education and the (less scant) literature on refugee education. Nkinyangi (1982) notes that Kenya attempted to

overcome its failure to reach the children of nomads by settling them in boarding schools. The government of Kenya built hostels at schools specified for nomads to encourage these children to attend school. (The policy did not succeed as will be discussed in a later section.)

In Mali, Woodrow (1987) reports that when nomads, whose livelihood was threatened by drought, were settled in a village, they began, very soon, to request schooling for their children. When the drought eased, the settlement remained fairly stable, largely because of the value placed by residents on this schooling. Schooling succeeded in this case because teachers were recruited from among the same nomadic tribal/ethnic group so parents were not afraid that the education would alienate their children from their cultural heritage.

Most of the education provided to refugee children is provided under the auspices of the United Nations High Commissioner for Refugees (UNHCR, 1986; Kalmthout, 1986). The children of refugees are in motion in the sense of being dislocated from their home society and environment. Also, they are often in this situation for several years or, even in some cases, over many generations. Still, because of their particular status, and because both refugees themselves and the host countries where they are encamped hope that they will soon be repatriated, local formal educational systems usually do not serve them. Thus, special programs must be set up to educate children in refugee camps. Ironically, these programs are sometimes superior to the education received in the same area by the local children through their national educational system.

Concluding Comments

The literature dealing with the factors influencing access to education is extensive and, for the most part, conclusive. These eight determining factors of differential access to, and retention in, schools are found in enough countries to be of interest to educational policy makers. Remoteness, poverty, and gender seem always to affect access although in some countries, such as Chile, the Philippines, and Botswana, to be female is sometimes an advantage rather than a disadvantage. Intra-family priority setting is difficult to generalize about, although there is evidence that this does have a differential impact on access in many countries. Ethnic, racial, and religious groups suffer disadvantages in educational access when there is prejudice against them. Countries vary widely in their provisions for including handicapped students and usually such students suffer severe educational disadvantage. Finally, it is difficult for educational systems to reach children who move about, so nomads, immigrants, and refugees are educationally disadvantaged unless they settle for a period of time.

Section IV: Policies to Improve Access

The literature on policies and programs to improve educational access is of limited scope and many studies are not immediately generalizable to other contexts. There are many reports and evaluations of specific project efforts to expand and equalize schooling for children, primarily available from the records of bilateral donors who have provided financial support to education development efforts. Also a number of the articles that deal with the problems of access include recommendations for policies and/or programs to improve it. Finally, there are a few articles that describe and analyze policies to improve access that have been tried in specific contexts. Missing in the literature are comprehensive, systematic, and comparative reviews of the effectiveness of different policies, programs, and projects in the different contexts in Africa, Asia, and Latin America.

From the literature that does exist, several common perspectives emerge. First is the recognition and repeated demonstration that policies intended to increase the overall supply of educational opportunities have increased access to education. However, while the numbers of children in school have increased, these policies have not been equally successful for all groups of children (Malakpa, 1986; Kelly, 1986; Lynch, 1982). Second, educational systems reflect and reinforce the larger socio-economic political context and, as such, cannot alone overcome discrimination and disadvantage directed at certain groups within the society. In fact, whatever disadvantage exists in other spheres of society shows up as a factor influencing participation and retention in schools (Court, 1975; Heneveld, n.d.; Wang, 1983; Islam, 1979). Third, because of these existing patterns of influence on participation, every policy either reinforces existing patterns of access and exclusion in schooling or challenges them. Finally, any attempt to overcome these society-based historical barriers to participation, through treating all children equally, will fail. Treating unequals as if they are equal is to perpetuate the inequality (Sherman, 1980; Wang, 1983) or to worsen it (Lynch, 1982).

These are obvious points. However, failure to make them explicit and to deal with them in terms of tailoring policies to specific problems results in the continuation of patterns of access to and exclusion from schooling. Thus, much of the literature on policy solutions to access problems in education focuses on understanding the causes of these problems and addressing them specifi-

Most countries would acknowledge that they face a real policy dilemma between pursuing education as a means to growth ...and providing education to all as an equal right.



cally and directly (Kelly, 1986; Robinson, et al., 1986; Wang, 1983; Adams, July 1980).

What are the policy options that educators have by which to overcome past exclusions from schooling and to improve access and retention in school? We have noted that the policies educational decision makers use may be classified according to their effect on the supply of schooling and their effect on the demand for schooling. Court (1975) points out that, while most of the literature looks at disparities in the supply of education as these give some groups advantage over others, there is an equally important disparity among groups in their demand for education. Often left over from colonial times, these patterns of expectations regarding the usefulness of education are so embedded in peoples' attitudes that they are even more difficult to overcome through educational policy than the resource constraints that limit educational supply (Court, 1975, p.19). The supply/effective demand dimensions of access provide a framework to examine the policy options for addressing the causes of unequal access to education.

Policies to Affect the Supply of Education

Where the demand for education is fixed, educational policy makers may affect access to and retention in school through manipulation of educational supply variables such as the provision, location, and equipping of schools; staff recruitment, training, and placement; curriculum design and materials; etc. Until all children in

...patterns of enrollment and non-participation are replicated from generation to generation...

a society are fully served, any improvement in the supply of schooling will result in an improvement in access for somebody in that society. Since no society has sufficient resources to meet all educational needs, real policy decisions and options arise in setting priorities among alternative uses of educational resources.

In the introduction to this review, we noted that educational policy makers may provide education either as a good, in and of itself, to which all children are entitled, or as a means to achieving another goal, usually economic development and national unity. In either case, educational policy makers have to set explicit priorities that reflect their goals.

Economic Growth

If the goal is economic growth and development, the policy question is how to focus educational resources to achieve economic growth and development most effectively. Overall, it is clear that significant expansion of education during the 1950's and '60's in the countries of Africa, Asia, and Latin America was not a predictor of economic growth in the 1960's and '70's in those countries (Lockheed, Jamison and Lau, 1980). However, the World Bank (*Strategies*, 1985) argues that research evidence justifies the adoption of policies that explicitly target certain populations for education if economic returns from educational investments are to be maximized. Lockheed, Jamison and Lau (1980) find that the productivity returns to educational attainment among farmers are significant. Kelly (1986) and others argue that findings that correlate female education with decreases in fertility rates justify a focused investment on education for females for overall gains in economic growth.

To justify targeting educational resources on farmers and females is to use the arguments of economic growth to refocus educational priorities away from those groups that have typically been advantaged, by showing that greater returns may be had by shifting educational investments to previously disadvantaged groups. However, other literature shows that the greatest economic returns to education may be realized by focusing on educating those who already have achieved fairly high access to education rather than trying to provide education to new, unreached groups (World Bank, *Research Brief*, 1985).

Behrman and Birdsall (1983) note that attempts to correlate schooling with productivity or economic returns are misleading insofar as they only relate the quantity of education, and not the quality, to outcomes. Arguing with the literature that claims the highest returns are found by investing in better off communities, they find that when they introduce a quality factor in the study of educating males in Brazil, the claim is not justified. They state that returns from educational investments are not measurable simply in terms of changes in the quan-

tity of education supplied to particular populations. And they suggest that if policy makers wish to target their educational investments to realize the greatest economic returns, they must take the quality of education into account as much as the quantity in order to determine where they will get their best returns.

Economic Growth and Equity

Most countries would acknowledge that they face a real policy dilemma between pursuing education as a means to growth (and, thus, targeting education in the most efficient way to achieve this growth) and providing education to all as an equal right. They need to be fair in providing equal access to social services while they are under pressure to ensure rapid economic growth, which will be, in the long run, for the benefit of all. However, even when equity is the goal of education, policy makers must set priorities among the populations to whom they will supply education because of limited resources. Whether the goal is education for growth or for equity, central ministries and policy makers still set priorities and target specific groups for educational inputs.

Equity

When the goal is equity, the policy choices for targeting are usually justified on the basis that they are designed to overcome past inequities. Governments undertake "positive discrimination" (Wang, 1983) to bring new groups into education who have previously been excluded. Some of the most helpful literature in this area of the policy reviews helps governments "sort out" their priorities by providing evidence about who, in any given context, should be the target of efforts to overcome past exclusions.

For example, Robinson, et al. (1986) note that studies of past exclusions can provide a precise predictor of who will and who will not be enrolled in schools in the next period. That is, patterns of enrollment and non-participation are replicated from generation to generation and government policy may be targeted to break these cycles. Policy makers need not be overwhelmed by vast needs (according to Robinson) but can focus on the limited percentage of the population whose patterns they seek to change. In the Egypt study, 28% of the families in the region were found to "need to be convinced" to send their children to school (p.A-99). Since the reasons these families did not send their children to school could be specifically described, policy makers had a specific programmatic focus. Other researchers agree that in many countries a clarification of the reasons for non-enrollment of particular groups can provide policy makers with specific program and policy options to change access patterns (Kelly, 1986; Adams, July 1980).

*...a clarification of the reasons for
non-enrollment of particular groups
can ...change access patterns.*

Unintended Consequences of Policies

The literature also presents cases where policies intended to overcome some existing disparity in educational access through the provision of new educational inputs had consequences that were unexpected and, all too often, reinforced past patterns of advantage and disadvantage. These cases caution against overconfidence in predicting policy outcomes on the basis of limited analysis. Several case histories illustrate this well.

Nkinyangi (1982) examines two policies implemented by the government of Kenya to increase access for poor and remote students. One was the abolition of school fees and the other was the provision of boarding schools in grazing land areas for the children of nomads, who would not otherwise be reached by day schools. He found that both policies had unexpected results and that neither succeeded in reaching the intended children to the extent desired or planned. This was because, in both cases, the policy dealt with only one aspect of the causes of non-participation and ignored others, thus creating new problems for access in the system.

Initially, by abolishing school fees, the government of Kenya substantially increased enrollments in schools in poor/rural areas. Interestingly, the percentage increase in female enrollments was higher than that for males, indicating that parents had valued education less for girls than for boys. Only with lower direct costs, in this case none, were they willing to send their girls to school. Access for children whose parents could not afford the fees initially improved across the board. However, over the longer run, because the educational planners had not dealt with how the revenues lost from fees would be made up, local school systems began to levy other types of fees to cover costs.

Communities (and families) with greater economic resources were therefore able to continue to provide schooling of a similar quality as before the abolition of fees. Poorer communities experienced a real deterioration in the quality of their schooling. The net result was that while more students were actually in school, the educational differential between poor and rich students in terms of quality (on a community by community basis) was not overcome and, in fact, may have worsened. Court's (1975) research agrees with Nkinyangi's, finding that the emphasis on self-help that accompanied the abolition of fees meant that richer communities were able to sustain and improve their educational systems while poorer communities fell farther and farther behind.

Nkinyangi (1982) also found that when boarding schools were built to provide living accommodations for children of nomads so that they could attend school, planners failed to consider the effects of poverty on the families' abilities to utilize these new schools. The newly

built schools had unfurnished rooms for the boarders; the students were to bring their own beds, blankets, pots, etc. The extra costs of these household essentials were prohibitive precisely for the populations for whom the new schools were intended. As a result, nomadic children did not take advantage of these new places. Children from wealthier families in other districts, who had been refused entry to limited school places in their districts, were able to gain entry into these schools by giving false addresses and taking advantage of the boarding facilities.

Similarly, Court (1975) found that when Tanzania adopted policies favoring the provision of primary schooling to all children before providing higher education to certain groups, there were unexpected results. Tanzania decided to postpone the building of secondary schools almost entirely, providing only a few in districts that had been completely left out. In a few years, however, private, fees-paying schools sprang up in those communities in which the government was not building secondary schools. These communities had experience with secondary schooling (they had had these schools for some years), and they were economically somewhat better off than those where no schools existed. The private schools they built and supported turned out to be superior to government schools. Access to secondary schools increased as an indirect outcome of the policy but in a manner that continued the disparity between rich and poor.

In all of these cases access to schooling improved. New places were created and more children attended school. However, the policy intent to overcome past barriers to participation and educational disparities (between rich and poor, between settled and nomadic), was not realized.

Quota systems designed to provide spaces in schools for previously excluded groups have been more effective in encouraging participation among targeted groups (Wang, 1983). In Bangladesh, 50% of the primary scholarships given at the end of class V are reserved for girls, thus addressing the tendency of girls to drop out of school at this level (The Foundation for Research on Educational Planning and Development, 1983). However, in other cases, the attempt to use quotas has had a "backlash" effect, causing other forms of discrimination that exclude the groups that the policies intended to help (Wang, 1983).

*Policies to Affect the Effective
Demand for Education*

Court's (1975) insight that the "disparity in demand for education" is as serious an impediment to school participation as disparities in the supply of education is an extremely important one for policy makers. Much of

...when groups perceive schooling as irrelevant, they will not enroll their children.

the research cited above demonstrates these variations in demand among groups and within families. As we have seen, when groups perceive schooling as irrelevant, they will not enroll their children. Costs, both direct and indirect, affect the demand for schooling. Parents claim that ethnicity and gender of teachers affect their decisions about sending their children to school. The school schedule, when it conflicts with tasks that the family considers essential, affects parents' willingness to enroll their children in school.

What policy options do educational policy makers have for affecting these determinants of the demand for schooling? Ministries of education can manipulate the demand for education primarily through the same variables that affect supply. That is, when families perceive education as irrelevant, policy makers can alter the curriculum (an aspect of educational supply) to make it more relevant (Wang, 1980). When ethnicity and/or gender of teachers matters, ministries can alter their staff recruitment and placement policies (Clark, 1981; CERID, 1983; Islam, 1979). When costs of schooling limit enrollments for specific groups such as the poor, rural, and females, ministries can enact policies providing free education and/or subsidies for specific groups (Noor, 1981; Singh, n.d.; Kelly, 1986; Tilak and Varghesa, 1985). The literature clearly gives these policy leads.

However, to define costs of schooling, the gender or ethnicity of the teacher, or the irrelevance of the curriculum as determinants of the failure to participate in school is not the same thing as to prove that decreasing costs, recruiting female teachers from specific ethnic groups, or teaching farming methods in school will bring those students into school. In fact, the research shows

that some efforts to increase educational relevance, for example, have resulted instead in dual tracking in the educational system with the result that those for whom the education was intended as relevant, view it as inferior. The consequence is that their demand for education remains low (Barber, 1981; Winter, 1984; Evans, 1981). While research shows a correlation between the presence of female teachers and the participation of female students in schools, there is doubt about the causation (Safilios-Rothschild, 1979), and research is not adequate to indicate that the recruitment and placement of female teachers will *ipso facto* result in improved access to schooling for girls. Further, the example from Nkinyangi (1982) demonstrated that the provision of boarding facilities was not enough to bring nomadic children into school even though location, timing, and costs of schooling had been important constraints on their participation.

Demand for education arises from multiple motivations and can be affected by many factors as we have seen. The cases cited here would indicate that it is rare, indeed, for a single factor to determine demand. Far more often, overlapping factors influence parents in their decisions about whether or not to enroll their children in school. Some of these factors are more, and some less, responsive to ministry of education policy initiatives. Ministries of education can alter supply variables to provide education for children and to attract those who have not previously come to school. Some of these alterations can affect parental demand for education for their children. Knowledge of the factors that determine the demand for education would, from the literature, appear to be a necessary, but not sufficient, condition for devising policies to improve access to schooling.

Section V: Conclusion

The literature on access to and retention in education is extensive. It provides strong description and analysis of the factors that determine differential access among groups. From the clarity of the research on these determinants, some writers have concluded that policy makers are well armed to devise policies that will be effective in improving access for everyone, including those groups who have previously been excluded.

However, where case studies exist of implemented policies, findings reflect varying levels of success relative to unintended consequences. Even where the determinants of exclusion from schooling are well understood—as in the case of poverty, for example—policies designed to reduce the costs of education have, even as they brought poor children into school, also increased the disparities between schooling for the poor and the rich.

Research to date provides strong lessons for policy makers who are concerned with access. In some cases, the lessons are as much about what does not work as about what does work. The literature suggests useful ways to sort among policy alternatives and to improve understanding of likely outcomes of policy options.

The realities of the context of policy making that must be acknowledged if policies are to be effective have received a great deal of research attention. Much of the literature deals with the fact that education systems fit within, reflect, and perpetuate the larger social/political/economic systems so that the policies cannot deviate very far from the norms and determinants of these larger systems (Yadav, 1980; Clark, 1981; Kelly, 1986; to name only a few who make this point). Thus, when new forms of education are supplied that are designed to improve access for a group that has been left out, those groups already advantaged by the system often co-opt the improvements.

In addition, policies can never be enacted as if they exist in a policy vacuum. The history of accumulated policies shapes the policy environment that, in turn, shapes the impact of any new policy.

Research results again and again demonstrate that the socio-economic context in which education is provided is complex and multi-layered. While we have found it useful to separate out eight factors that determine differential access to education, it is also necessary to remember that these factors can overlap and compound each other. In our discussion we often noted interrelation-

ships; for example, that poverty goes with remoteness; that poor, rural females have less access to schooling than their urban counterparts; and that in some instances, urban girls have greater access than rural boys. The literature shows that the factors that affect access interact with each other, sometimes reinforcing a bias and sometimes counteracting it.

Ongoing efforts to engage the very groups who are excluded from schooling in policy formulation to overcome their exclusion,...would be instructive for policy makers.



How does the literature help policy makers deal with these complexities? From our review of the research to date, three guides are suggested.

First, the research of Court (1975) and others reminds us that there are patterns of demand for education among different groups that are based in historical and traditional patterns of expectations. These are identifiable and traceable and, once understood, provide the background for policy initiatives. Kelly (1987) makes this point especially clear in relation to female education where she points out that, while much location-specific research remains to be done, it is clear from existing research that female enrollments increase when: 1) schools are made available for girls; 2) these schools provide conditions that make it possible for girls to attend; and 3) the education provided is linked with work force opportunities for women.

Second, the research of Robinson, et al. (1986) in Egypt indicates that patterns of educational demand are consistent over generations so that once policy makers have identified the groups (families) in their countries

...even as policies are being tried, we should gather information about implementation successes and failures...

who do not send their children to school in one period, they can with some certainty predict that these same groups should be the focus of future policies to affect demand and increase access. This means that, in these specific contexts, policy makers do not have to consider all possible determinants of effective demand but can instead focus on those sets of factors that are important among particular groups within their own context.

Third, the research on policy initiatives that have been tried (Nkinyangi, 1982; Court, 1975; Barber, 1981; Winter, 1984) shows that even within a specific context, demand is never a reflection of a single factor. Multiple factors must be taken into account if the outcomes of any policy are to be those desired. From the cases cited in Section IV where a policy initiative did not have its intended impact, it would appear that the failure to acknowledge the overlap of multiple determinants accounts for the failure of the policy to achieve its goal. Each of the policies that failed focused only on a single factor that affects demand and did not take into account other related, compounding factors. Policy makers should note that even though one factor may appear dominant in determining any group's effective demand for education, it is almost inevitable that other factors will also be important and the relationships among these factors must be understood before an effective policy can be devised.

These three findings from the literature do provide guidelines for policy. They help: a) focus attention on factors that affect effective demand in context; b) remind policy makers to consider the relationships among these factors that, while not obvious, must be considered in policy making; and c) focus on the groups or families, again in context, that should be the priority for policy initiatives.

Guidelines for future research also emerge from this review. Given the importance of understanding the ways

in which multiple factors affect access, research focused on the families and groups that are excluded is called for. Specifically, research is needed that gathers information from these people, not only on what they claim are the reasons they do not send children to school, but, more importantly, on what would convince them to enroll their children. Ongoing efforts to engage the very groups who are excluded from schooling in policy formulation to overcome their exclusion, and the results of these efforts, would be instructive for policy makers both in the country where such research is done and in other countries as well.

Finn (1978) also suggests that we need additional "descriptive research" done in the "natural laboratories" of educational systems that are involved in implementing trial policies to improve access. That is, even as policies are being tried, we should gather information about implementation successes and failures that would add to general knowledge and ability to address access.

Finally, systematic, comprehensive comparisons of experiences with different access policies across cultures and educational systems, and their results, would help identify which factors (and combinations of factors) are most significant, and under what circumstances, in affecting policy outcomes for improving access.

Increasing access to education, particularly for those groups of people who have been disadvantaged by past policies, remains a central focus for ministries of education around the world. Much has been learned about patterns of access and exclusion, and there is a more sophisticated understanding of the determinants of exclusion and the ways in which these reinforce or counteract each other. Additional studies of efforts to include previously excluded children, and of the motivations and experiences of the people affected, are needed to achieve the goal of equal access to schooling—and equal quality in that schooling—for all children.

Bibliography

- Adams, Frances McStay. "Early Education for Girls: A Priority for Literacy." Prepared for the Office of Women in Development, U.S. Agency for International Development. Equity Policy Center, Washington, D.C., Oct. 1980.
- Adams, Frances M. "Education and Training for the World's Poorest Women and Girls." Paper prepared for the Office of Women in Development, U.S. Agency for International Development, Nov. 1980.
- Adams, Frances McStay. *Summary and Highlights of Review and Evaluation of Program Achieved in the Implementation of the World Plan of Action: Education*. Copenhagen, Denmark, July 1980.
- Adelman, Irma, and Cynthia Taft Morris. *Economic Growth and Social Equity in Developing Countries*. Stanford, CA: Stanford University Press, 1973.
- Anderson, Mary B. "The Multi-Sectoral Rural Development Project, Busoga, Uganda: A Case Study." Prepared for PACT, New York, 1986.
- Ashby, Jacqueline A. "Equity and Discrimination Among Children: Schooling Decisions in Rural Nepal." *Comparative Education Review*, Vol. 29, No. 1, Feb. 1985, pp. 68-79.
- Barber, Elinor G. "General Education Versus Special Education for Rural Development." *Comparative Education Review*, Vol. 25, No. 2, pp. 216-231.
- Barnes, Barbara. "Education for Socialism in Mozambique." *Comparative Education Review*, Vol. 26, No. 9, Oct. 1982, pp. 406-419.
- Beautheac, Nadine. "Equality of Access of Women to Education: Nepal." UNESCO, Paris, Aug. 1971.
- Behrman, Jere R., and Nancy Birdsall. "The Quality of Schooling: Quantity Alone is Misleading." *American Education Review*, Vol. 73, No. 5, Dec. 1983.
- Birdsall, N. "Birth Order Effects and Time Allocation." The World Bank, June 1980.
- Bowles, Samuel. "Cuban Education and the Revolutionary Ideology." *Harvard Educational Review*, Vol. 41, No. 4, Nov. 1971.
- Bowman, Mary Jean, and C.A. Anderson. "The Participation of Women in Education in the Third World." *Comparative Education Review*, Vol. 24, No. 2, Part 2, June 1980.
- Bray, Mark. "High School Selection in Less Developed Countries and the Quest for Equity: Conflicting Objectives and Opposing Pressures." *Comparative Education Review*, Vol. 29, No. 2, 1985, pp. 216-231.
- Bray, T.M., and G.R. Cooper. "Education and Nation Building in Nigeria since the Civil War." *Comparative Education Review*, Vol. 15, No. 1, March 1970, pp. 33-41.
- Brenner, Mary E. "Student Attitudes and School Attendance in Liberia." Paper presented at the American Anthropology Association Meeting, Washington D.C., Dec. 3-7, 1982.
- Brown, Barbara. "Girls' Achievement in School in Botswana." *Botswana Notes and Records*, Vol. 12, No. 1, no date.
- Bullivant, Brian M. "Cultural Reproduction in Fiji: Who Controls Knowledge/Power?" *Comparative Education Review*, Vol. 27, No. 2, June 1983, pp. 227-245.
- CERID, Research Centre for Educational Innovation and Development. "Primary Education in Nepal: Papers Towards Universalization." Tribhuvan University, Lizimpat, Kathmandu, 1983.
- CERID/WEI, Research Centre for Educational Innovation and Development. *Determinants of Educational Participation in Rural Nepal*. Kathmandu: Tribhuvan University Press, 1984.
- Chamie, Mary. "National, Institutional and Household Factors Affecting Young Girls' School Attendance in Developing Countries." International Center for Research on Women and USAID, Washington, D.C., Nov. 1983.
- Clark, Carol A.M. "Children's Economic Activities and Primary School Attendance in Rural Guatemala." Santa Monica, CA: The Rand Paper Series, The Rand Corporation, April 1981.
- Cochrane, Susan H., and Dean T. Jamison. "The Determinants and Consequences of Educational Achievement in the Rural Chiang Mai Valley." Population and Human Resources Division, Discussion Paper, No. 81-61, The World Bank, Washington, D.C., Dec. 1981.

Court, David. "Education as Social Control: The Response to Inequality in Kenya and Tanzania." Discussion Paper No. 217, Institute for Development Studies, University of Nairobi, Nairobi, June 1975.

Crandon, Dr. Libbett with Bonnie Shepard. *Women, Enterprise and Development*. The Pathfinder Fund's Women in Development: Projects, Evaluation and Documentation Program. Chestnut Hill, MA, Dec. 1984.

Csapo, Marg. "Religious, Social and Economic Factors Hindering the Education of Girls in Northern Nigeria." *Comparative Education*, Vol. 17, No. 3, 1981, pp. 311-319.

Dixon, Ruth B. "Women's Rights and Fertility." Reports on Population/Family Planning, No. 17, The Population Council, New York, Jan. 1975.

Evans, David R. "The Educational Policy Dilemma for Rural Areas." *Comparative Education Review*, Vol. 25, No. 2, June 1981, pp. 232-243.

Finn, Jeremy D. "Sex Differences in Educational Attainment." Paper prepared for Ford Foundation. Unpublished. State University of New York at Buffalo, Dec. 11, 1978.

Finn, Jeremy D., Janet Reis, and Loretta Dulberg, "Sex Differences in Educational Attainment: The Process." *Comparative Education Review*, Vol. 24, No. 2, Part 2, June 1980.

The Foundation for Research on Educational Planning and Development. "Assessment of Female Education in Bangladesh: Part I: Summary of the Major Findings and Recommendations." Dhaka University, March 1983.

Ginsburg, Mark B., and Beatriz Arias-Godinez. "Non-formal Education and Social Reproduction/Transformation: Educational Radio in Mexico." *Comparative Education Review*, Vol. 28, No. 1, Feb. 1984, pp. 116-127.

Goldstone, Leo. "Sex Disparity in Primary Education." International Institute for Educational Planning, UNESCO, Paris, 1986.

Gunawardena, Chandra. "Ethnic Representation, Regional Imbalance and University Admissions in Sri Lanka." *Comparative Education Review*, Vol. 15, No. 3, Oct. 1979.

Heneveld, Ward. "The Distribution of Resources for Educational Expansion in East Java." Ministry of Education and Culture, Jakarta, n.d.

Heyneman, Stephen P. "Education During a Period of Austerity: Uganda, 1971-1981." *Comparative Education Review*, Vol. 27, No. 3, Feb. 1983, pp. 403-413.

Hirsch, Fred. *Social Limits to Growth*. Cambridge: Harvard University Press, 1978.

ICED (International Council for Educational Development). "Building New Educational Strategies to Serve Rural Children and Youth." Draft of a Second Report to UNICEF, 1974.

Islam, Mahmuda. "Female Primary Education in Bangladesh." Women for Women Research and Study Group, Dacca, 1979.

Jamison, Dean T. "Child Malnutrition and School Retardation in China." Population and Human Resources Division, Discussion Paper No. 81-27, World Bank, Washington, D.C., Sept. 1981.

Jones, Marie Thourson. "Education of Girls in Tunisia: Policy Implications of the Drive for Universal Enrollment." *Comparative Education Review*, Vol. 24, No. 2, June, 1980, pp. 106-123.

Kalmthout, Ellen van. "UNHCR's Assistance Programme for Primary Education." UNHCR, unpublished document, Geneva, 1986.

Kelly, Gail P. "Setting State Policy on Women's Education in the Third World: Perspectives from Comparative Research." Paper prepared for Nordic Symposium for Educational Research in Developing Countries. Jyväskylä, Finland, Sept. 1986. Also in: *Comparative Education*, Vol. 23, No. 1, 1987.

Kelly, Gail P., and Younus Lulat. "Women and Schooling in the Third World: A Bibliography." *Comparative Education Review*, Vol. 24, No. 2, June 1980, pp. 224-263.

King, Elizabeth M. "Child Schooling and Time Allocation in Philippine Rural Households." Paper presented at the Population Association of America meetings. Washington, D.C., March 26-28, 1981.

King, Elizabeth M., and Lee A. Lillard. "Determinants of School Attainment and Enrollment Rates in the Philippines." Santa Monica, CA: Rand Corporation, 1983.

King, Ursula. "World Religions, Women and Education." *Comparative Education*, Vol. 23, No. 1, 1987.

Lewis, Gwendolyn L. "Aspirations for Daughters' Schooling in Turkey: Comparisons between Mothers and Fathers and Contrasts with Sons." Unpublished manuscript, Department of Sociology, University of Pittsburgh, July 1979.

LeVine, Robert A. "Influence of Women's Schooling on Material Behavior in the Third World." *Comparative Education Review*, Vol. 24, No. 1, Part 2, June 1980.

Lockheed, Marlaine E., and Dean T. Jamison. "Some Determinants of School Participation in the Terai Region of Nepal." World Bank, Washington, D.C., Sept. 1979.

- Lockheed, Marlaine E., Dean T. Jamison, and Lawrence J. Lau. "Farmer Education and Farm Efficiency: A Survey." *Economic Development and Cultural Change*, Vol. 29, No. 1, Oct. 1980, pp. 37-76.
- Loehr, William, and John P. Powelson. *The Economics of Development and Distribution*. New York: Harcourt Brace Jovanovich, Inc., 1981.
- Lynch, Barbara D. "Vincos Experiment: A Study of the Impacts of the Cornell-Peru Project in a Highland Community." U.S. Agency for International Development, Bureau for Latin America and the Caribbean, April 1982.
- Lynch, Patrick D. "From Quantity to Quality—The Decline of Access to Schooling in the Developing Countries in the 1980's." Paper presented at the American Educational Research Association, San Francisco, April 20, 1986.
- Malakpa, Sakui. "The Influence of Laws and Regulations on Access to Education in Developing Countries." BRIDGES Project, Harvard University, 1986.
- McSweeney, Brenda G., and Marion Freedman. "Lack of Time as an Obstacle to Women's Education: The Case of Upper Volta." *Comparative Education Review*, Vol. 24, No. 2, Part 2, June 1980.
- Monchar, Philip Harris. "Regional Educational Inequality and Political Instability." *Comparative Education Review*, Vol. 25, No. 1, Feb. 1981, pp. 1-12.
- Moock, Peter, and Joanne Leslie. "Childhood Malnutrition and Schooling in the Terai Region of Nepal." World Bank Discussion Paper, Washington, D.C., Dec. 1985.
- Niles, F. Sushila. "Social Class and Academic Achievement: A Third World Reinterpretation." *Comparative Education Review*, Vol. 25, No. 3, October 1981, pp. 419-430.
- Nkinyangi, John A. "Access to Primary Education in Kenya: The Contradictions of Public Policy." *Comparative Education Review*, Vol. 26, No. 2, June 1982.
- Noor, Abdun. "Steps Toward Implementing a Policy for Universalizing Basic Education." Education and Basic Human Needs, Working Paper No. 450, World Bank, Washington, D.C., April 1981.
- Obiakor, Festus E. "The Universal Primary Education Program in Nigeria: Revisited." Unpublished paper, 1983.
- Overholt, Catherine, Mary B. Anderson, Kathleen Cloud, and James E. Austin. *Gender Roles in Development Projects: A Case Book*. West Hartford, CT: Kumarian Press, 1985.
- Oxenham, John. "New Opportunities for Change in Primary Schooling." *Comparative Education Review*, Vol. 20, No. 2, 1984.
- Psacharopoulos, George. "The Economics of Higher Education in Developing Countries." *Comparative Education Review*, Vol. 26, No. 2, June 1982, pp. 139-159.
- Ram, Rati. "Male-Female Differences in Educational Outcomes, with Special Reference to the Labor Market." Research Report prepared for the Ford Foundation, June 1979.
- Ram, Rati. "Public Subsidization of Schooling and Inequality of Educational Access." *Comparative Education Review*, Vol. 26, No. 1, Feb. 1982, pp. 36-47.
- Robinson, Wade M., Team Leader, et al. *Third Annual Report of the Study of USAID Contributions to the Egyptian Basic Education Program*. Vol. II. Washington, D.C.: Creative Associates, Feb. 1986.
- Safilios-Rothschild, Constantina. "Adolescent Urban Girls in Developing Countries." International Center for Research on Women, Washington, D.C., Oct. 1982.
- Safilios-Rothschild, Constantina. "Access of Rural Girls to Primary Education in the Third World: State of Art, Obstacles, and Policy Recommendations." Office of Women in Development, U.S. Agency for International Development, Washington, D.C., Oct. 1979.
- Schiefelbein, Ernesto, and Joseph P. Farrell. "Women, Schooling, and Work in Chile: Evidence from a Longitudinal Study." *Comparative Education Review*, Vol. 24, No. 2, Part 2, June 1980, pp. 160-179.
- Sherman, Joel D. "Equity in School Finance: A Comparative Case Study of Sweden and Norway." *Comparative Education Review*, Vol. 24, No. 3, Oct. 1980, pp. 389-399.
- Singh, Madhu. "How Equal are the Scheduled Castes? Some Aspects of their Educational Development." Bulletin of the I.I.E., no date.
- Sivard, Ruth Leger. "Women: A World Survey." Washington, D.C.: World Priorities, 1985.
- Smith, Peter C., and Paul P.L. Cheung. "Social Origins and Sex-Differential Schooling in the Philippines." *Comparative Education Review*, Vol. 25, No. 1, Feb. 1981, pp. 28-42.
- Tilak, Jandhyala B.G., and N.V. Varghesa. "Discriminatory Pricing in Education." Occasional Paper No. 8, National Institute of Educational Planning and Administration. New Delhi, 1985.

Tinker, I., B.M. Bramsen. "Proceedings of the Seminar on Women and Development." *Women and World Development*, ed. I. Tinker and B.M. Bramsen, Washington, D.C., American Association for Advancement of Sciences, 1975, pp. 138-218.

UNESCO. Fourth Consultation of Member States on the Implementation of the Convention and Recommendations Against Discrimination in Education: Report on the Committee on Conventions and Recommendations." Sofia, Aug. 1985.

Walters, Pamela Barnhouse. "Educational Change and National Economic Development." *Harvard Educational Review*, Vol. 51, No. 1, Feb. 1981, pp. 94-106.

Wang, Bee-Lan Chan. "Sex and Ethnic Differences in Educational Investment in Malaysia: The Effects of Reward Structures." *Comparative Education Review*. Vol. 24, No. 2, June, 1980.

Wang, Bee-Lan Chan. "Positive Discrimination in Education: A Comparative Investigation of its Bases, Forms and Outcomes." *Comparative Education Review*, Vol. 27, No. 2, June 1983.

Waweru, Julius Macharia. "Socio-Economic Background as an Influence Factor in Pupils' Achievement in Primary Schools in Embu District, Kenya." *African Studies in Curriculum Development and Evaluation*, No. 69. African Curriculum Organization. Kenya Institute of Education, Nairobi, 1982.

Weis, Lois. "Education and the Reproduction of Inequality: The Case of Ghana." *Comparative Education Review*, Feb. 1979, pp. 41-51.

White, Benjamin, and Endang Lestari Hastuti. "Different and Unequal: Male and Female Influence in Household and Community Affairs in Two West Javanese Villages". Project on Rural Household Economics and the Roles of Women. Centre for Rural Sociological Research, Bogor Agricultural University, Feb. 1980.

Winter, Carolyn. "The Provision of Appropriate Education in Selected South African Countries: Malawi, Zimbabwe, Namibia, and the 'Independent' South African Homelands." Paper presented at the International Conference on Education in the 90's "Equality, Equity and Excellence in Education," Dec. 1984.

The World Bank. "The Best School Investments? More on quality and more on rural areas, at least in Brazil." *Research Brief*, Vol. 6, No. 2, Fall 1985.

The World Bank. "Education Strategies for Sub-Saharan Africa." Draft Report, Dec. 1985.

UNHCR, "Overview of UNHCR Educational Assistance," internal paper, Geneva, June 17, 1986.

Woodrow, Peter J. "Nomad Program: Tin Aicha, Mali." International Relief/Development project, Harvard Graduate School of Education, Cambridge, MA.. July 1987.

Yadav, R.K. "Tasks Ahead for Indian Education." *Comparative Education Review*, Vol. 16, No. 3, Oct. 1980.

Youssef, Nadia H. "Education and Female Modernism in the Muslim World." *Journal of International Affairs*. 30, 2 (1976), pp. 191-205.

Supplementary Bibliography

- Abeje, Haile Yesus. "How to Provide Universal Schooling." *Prospects*, Vol. 13, No. 2 (1983), pp. 245-249.
- Adams, Milton N., and Susan E. Kruppenbach. "Some Issues of Access and Equity in the Education of African Females: Progress and Prospects." Forthcoming in the Working Paper Series on Women in International Development, Michigan State University, April 1986.
- "AID and Education: A Sector Report on Lessons Learned." AID Program Evaluation—Report No. 12, Jan. 1984.
- "Agency for International Development Sector Strategy: Education." U.S. Agency for International Development, Washington D.C., Aug. 1983.
- Anderson, Mary B. "Gender Issues in Basic Education and Vocational Training." Office of Women in Development, U.S. Agency for International Development Office, Washington, D.C., Sept. 1986.
- Arnove, Robert F. "A Comparison of the Chinese and Indian Education Systems." *Comparative Education Review*, Vol. 28, No. 3, August, 1984, pp. 378-401.
- Bereday, George Z. F. "The Law and Exclusion from Schools in Comparative Perspective." *Comparative Education Review*, Vol. 24, No. 2, Part 1, June 1980.
- Carloni, Alice Stewart. "Lessons Learned 1972-1985: The Importance of Gender for AID Projects." Draft Report prepared for U.S. Agency for International Development, Washington, D.C., Oct. 1985.
- Carnoy, Martin. "Education for Alternative Development." *Comparative Education Review*, Vol. 26, No. 2, June 1982.
- Cochrane, Susan H., et al. "The Effects of Education on Health." World Bank Staff Working Paper, No. 405, July 1980.
- Creative Associates. Second Annual Report for the Study of USAID Contributions to the Egyptian Basic Education Program. Washington, D.C. Sept. 1985.
- Creative Associates. Summary of the Second Annual Report for the Study of USAID Contributions to the Egyptian Basic Education Program. Washington, D.C. Sept. 1985.
- Development Alternatives, Inc. *A Seven Country Survey on the Role of Women in Rural Development*. Report prepared for Agency for International Development. Washington, D.C., Dec. 1974.
- Drenth, Peter J.D., Hank van der Flier, and Issa M. Omari. "Educational Solution in Tanzania." *Evaluation in Education*, Vol. 7, 1983, pp. 93-198.
- Elgqvist-Saltzman, Inga, Annika Forslund, and Keiko Sampei. "The 1985 Symposium of the Nordic Association for the Study of Education in Developing Countries on North-South Education Research Cooperation and Dissemination of Research Results." Department of Education, University of Umea, Sweden, 1985.
- Elliott, Carolyn M., and Gail P. Kelly. "Introduction: Perspectives on the Education of Women in Third World Nations." *Comparative Education Review*, Vol. 24, No. 2, Part 2, June 1980.
- Farquhar, William W., Nat J. Culletta, and Donald F. Enos. "Towards a More Efficient Primary Education System: An Experimental Approach to the Problem of Drop-out and Repetition." Study conducted on behalf of U.S. Agency for International Development by American Association of Colleges for Teacher Education, Washington, D.C., March 1976.
- Flores, Pedro V. "Educational Innovation in the Philippines: A Case Study of Project Impact." Ottawa, Canada: International Development Research Centre, 1982.
- Hermalin, Albert I., Judith A. Seltzer, and Ching-Hsiang Lin. "Transitions in the Effect of Family Size on Female Educational Attainment: The Case of Taiwan." *Comparative Education Review*, Vol. 26, No. 2, June 1982, pp. 254-270.
- Heyneman, Stephen P., and Dean T. Jamison. "Student Learning in Uganda: Textbook Availability and other Factors." *Comparative Education Review*, Vol. 24, No. 2, Part 1, June 1980, pp. 206-222.
- Heyneman, Stephen P., and William A. Loxley. "The Distribution of Primary School Quality within High- and Low-Income Countries." *Comparative Education Review*, Vol. 27, No. 1, Feb. 1983, pp. 108-118.

- Hoque, Naseem. "Non-Formal Education for Women in Bangladesh." With emphasis on agency and organizational programs serving economically disadvantaged women. Paper prepared for U.S. Agency for International Development. Series: Michigan State University. 1976.
- Kay, Stafford. "Early Educational Development in East Africa: A Case Study." *Comparative Education Review*, Vol. 23, No. 1, Feb. 1979, pp. 66-81.
- Lee, Kye-Woo. "Equity and an Alternative Educational Method: A Korean Case Study." *Comparative Education Review*, Vol. 25, No. 1, Feb. 1981, pp. 45-63.
- Lembert, Marcella. "The Impact of Mother's Beliefs, Expectations and Attributions on Children's Primary School Drop-out: A Case Study on Low Socio-Economic Status Urban Mexico." Unpublished paper, Stanford University, Nov. 1981.
- Lupidi, Helena R. "A Comparative Analysis of the Factors Associated with Career Aspirations of Brazilian Students by Sex and Grade Level." U.S. Agency for International Development, Washington, D.C., 1976.
- Mante, Rosetta F. "Multiple Outcomes and Perspectives in the Evaluation of Project Impact." *Teaching Yourself in Primary School: Report of a Seminar on Self-Instructional Programs*. Ottawa, Canada: International Development Research Centre, 1982, pp. 72-80.
- McGinn, Noel F. "Data Requirements for Research Projects." Paper prepared for BRIDGES Project, Harvard University, May 1986.
- Nash, Roy. *Schooling in Rural Societies*. London, New York: 1980. Methuen (Contemporary Sociology of the School).
- Navia-Melbourn, Olga, and Julia MacKenzie. "Women in Development and the Project Cycle: A Workbook." Canadian International Development Agency, Ottawa, June 1986.
- Nichols, Daryl G. "Low-Cost Learning Systems: The General Concept and Some Specific Examples." *NSPI Journal*, Sept. 1982.
- Nji, Ajaga and Katherine L. "Why My Mother Died Illiterate: For an Appropriate Technology in Adult Literacy Programs in Cameroon." *IFDA Dossier* 46, March/April 1985, pp. 3-14.
- Office of Women in Development, U.S. Agency for International Development. "Illustrative Statistics on Women in Selected Developing Countries." U.S. Department of Commerce, Bureau of the Census, Washington, D.C., June 1980.
- Office of Women in Development, U.S. Agency for International Development. "Women in Development: The First Decade, 1975-1984." Report to the Committee on Foreign Relations, U.S. Senate and the Committee on Foreign Affairs, U.S. House of Representatives. Washington, April 1985.
- Othman, Ghazali, and K. Loganathan. "Assessing the Impact and Effectiveness of Project Inspire's Educational Materials." *Teaching Yourself in Primary School: Report of a Seminar on Self-Instructional Programs*. Ottawa, Canada: International Development Research Centre, 1982, pp. 49-59.
- Singhal, Sushila. "The Development of Educated Women in India: Reflections of a Social Psychologist." *Comparative Education*, Vol. 20, No. 3, 1984, pp. 355-370.
- Stromquist, Nelly P. "Empowering Women through Knowledge: Policies and Practices in International Cooperation in Basic Education." Report prepared for UNICEF. June 7, 1986.
- Thiagarajan, Sivasailam, and Aida L. Passigna. "Final Contractor's Report: Improved Efficiency of Learning (IEL) Project." McLean, VA: Institute for International Research, Inc., 1986.
- Tuppen, C.J., and Brian Deutsom. "Comparison of Educational Standards of Achievement when Opportunities for Education are Unequal." *Comparative Education Review*, Vol. 26, No. 1, 1982, pp. 69-77.
- Wang, Bee-Lan Chan. "Educational Reforms for National Integration: The West Malaysian Experience." *Comparative Education Review*, Vol. 22, No. 3, Oct. 1978, pp. 464-479.
- Weigand, Pablo. "Education and Social Class, Disparity and Conflict in Latin America, with Special Reference to Minority Groups in Chile." *Comparative Education*, Vol. 19, No. 2, 1983, pp. 213-218.
- Wilson, Michael. "Retentivity of Educational Standards of Achievement." *Comparative Education Review*, Vol. 28, No. 3, Aug. 1984, pp. 485-490.
- The World Bank. "Notes on Education for Females." Office of the Advisor on Women in Development, March 1981.
- "World Development Forum," Vol. 4, No. 21, Nov. 30, 1986. The Hunger Project, Washington, D.C.

A process of reproduction as nonconscious and nonrational as this would appear to be much easier to change than one in which a ruling class consciously set out to guarantee its continued privilege. And given that within the ruling class there is considerable struggle over control of resources, the process of change would seem even easier. Even among leading groups within the ruling party there is considerable questioning of the development strategy that has been pursued during the past 40 years—a strategy in which the peasant class has been squeezed to provide capital for the modern sector, and dependence on foreign capital (and, more recently, on exports of petroleum) has allowed the capitalist class to increase its standard of living and maintain hegemony. The reformist group within the SEP is part of the faction that is looking for alternative strategies, but in the process new contradictions will come to light. Their interest in rationalization of decision making in education could result in greater use of information that evaluates outcomes, and might in time contribute to a weakening of the meritocratic myth of education. But “easier” is not “easy,” and the struggle for change will be uphill.

Access to Primary Education in Kenya: The Contradictions of Public Policy

JOHN A. NKINYANGI

Despite all the signs of rising “educated unemployment” and the relative devaluation of occupational positions, in most of Africa, as in other developing regions, schooling still remains the only route of upward mobility for the lower classes. Because they are either unable or, more appropriately, unwilling to effect a more straightforward design for the redistribution of national wealth, policymakers in most developing countries increasingly prescribe schooling. As a result, the masses clamor for it and governments respond by allocating substantial portions of their recurrent budgets to it. Between 1960 and 1968, for example, public expenditures on education doubled in Africa and Latin America and almost tripled in Asia. Between 1970 and 1973, although educational expenditure declined elsewhere, public expenditures for education doubled in the Arab states.¹

The figures cited above are for public expenditures by ministries of education alone. Including other ministries' contributions to education might easily double the figures for public expenditures on education.² These figures do not reflect the private costs of education, consisting of direct costs to parents as well as income forgone by pupils. These costs are relatively high in all developing areas. But despite rather heavy public and private outlays on formal education, for the majority of Third World children and their parents the dream of upward mobility through education seems to end only in failure or disappointed hopes; for substantial numbers of children, schooling either remains closed or is a difficult puzzle to complete once they are in the system.³

In many developing countries, equality of educational opportunity has therefore become a social and political goal to which many bilateral and

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¹ John Simmons, ed., *The Education Dilemma: Policy Issues for Developing Countries in the 1980s* (Oxford: Pergamon, 1980), pp. 27-28. See also World Bank, *Education: Sector Policy Paper* (Washington, D.C.: World Bank, 1980), pp. 67-68.

² Simmons, p. 27.

³ According to the latest available cross-country data, less than 60 percent of the relevant school-age population were actually enrolled in primary school in Burundi, Ethiopia, Malawi, Rwanda, Somalia, the Sudan, Tanzania, Uganda, Benin, the Central African Republic, Chad, the Gambia, Ghana, Guinea, Mali, Mauritania, Senegal, Sierra Leone, Upper Volta, Morocco, Guatemala, Haiti, Nicaragua, Bangladesh, Nepal, Pakistan, Afghanistan, Oman, and the Yemen Arab Republic. In most countries there were serious disparities in enrollment ratios by sex, and repetition and dropout rates were also high. In many of the countries, e.g., less than 50 percent of the pupil cohorts reached grade 6 (World Bank, annex 7, pp. 108-13; annex 10, pp. 118-19).

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multilateral aid organizations have lent their support by encouraging reforms which seek to expand and equalize educational opportunities. In policy terms, at least, these undertakings seem to be official attempts to improve access in all parts of a country or region, and to create equal, or nearly equal, enrollment ratios for various segments of the population.⁴

This paper looks at the experience of one African country, Kenya, in its implementation of some such reforms. Primarily, the paper examines two policy interventions meant to improve educational opportunity to the less privileged members of Kenyan society:⁵ the so-called abolition of school fees in the primary schools, and the institution of primary boarding schools in the arid and semiarid areas of the country. The effects of both interventions are assessed by analysis of school participation rates and repetition and dropout rates. When all available evidence is considered, it can be seen that during the 1970s, these and related government policies in fact were both cause and effect of educational failure, with possible implications for increased regional disparities and social differentiation.

On the Meaning of Educational Failure

The definition of *success* implied in this paper is itself tacitly employed by the Kenyan social system: that is, the timely and systematic progression of pupils from one grade to another, as well as from one level of schooling to another. I should, however, quickly point out that in Kenya as elsewhere such notions of progression or school success seem to exist in utter contradiction to existing educational theory and practice.

On the one hand, notions of educational efficiency popularized by such organizations as the World Bank and Unesco see grade repetition as a form of "wastage" which raises unit costs while also taking away places which could have been made available for children not receiving the benefits of schooling. On the other hand, curbing grade repetition seems to contradict another prevalent educational notion which justifies letting weaker and less endowed children proceed through the curriculum at their own pace. Moreover, support for automatic progression between grades seems to be based on the assumption that a group of children entering school at the

⁴ Ibid., p. 25.

⁵ The colonial and postcolonial experiences have transformed Kenya from a society of largely egalitarian communities into a society differentiated on the basis of social class. According to the class structure which seems to be emerging, Kenyan society is composed of a small bourgeoisie, a slightly bigger petite bourgeoisie, a much larger proletariat, and a class of peasants and pastoralists numbering many millions. For some recent class analyses of the Kenyan society see Colin Leys, *Underdevelopment in Kenya: The Political Economy of Neo-Colonialism* (London: Heinemann, 1975); R. Sandbrook, *Proletarians and African Capitalism: The Kenyan Case, 1960-72* (London: Cambridge University Press, 1975); M. Cohen and K. Kinyanjui, "Some Problems of Capital and Class in Kenya" (Occasional Paper no. 26, University of Nairobi, Institute for Development Studies, 1977); Nicola Swainson, *The Development of Corporate Capitalism in Kenya 1918-77* (London: Heinemann, 1980); and Gavin Kitching, *Class and Economic Change in Kenya: The Making of An African Petite Bourgeoisie* (New Haven, Conn.: Yale University Press, 1980).

same age can progress together through a prescribed syllabus of instruction at the same rate. Evidence from almost every country, in terms of age profiles and success rates, completely refutes this claim. In addition, concern with educational efficiency by itself (and the usually resultant policy-makers' obsession with reducing unit costs) may be one reason that in many countries Johnny cannot read or write.

The notion of school failure is even more cogent when applied to the school dropout. As investigations in Kenya have shown, there is more desire to continue schooling, at all grades and levels, than there is possibility or capability for it and than economic and social constraints allow.⁶ These objective barriers are particularly important in explaining the incidence of early dropouts (in the first 4 years of primary school) as well as later dropouts (when the transition between primary and secondary school is made after grade 7).

For these reasons pupils who reach the final grade of primary school but do not qualify to enter secondary school and do not repeat (or cannot afford to repeat since this entails outlays of scarce resources) are also to be seen as school dropouts. The educational system in Kenya, as in many other developing countries, is structured to promote children from one level of schooling to another. All rewards in contemporary Kenya, in the way of jobs and incomes, seem to coincide with the type and level of schooling obtained. Children who unwillingly discontinue their education at the end of primary school cannot officially be defined as anything other than dropouts. Although from an objective point of view one hesitates to regard one who has had 4 years of schooling and another who has had 7 as dropouts, the two are "failures" nevertheless. This is certainly the traumatic view of most parents whose children have been so derailed.

In terms of visible benefits (e.g., wealth, power, and social status), parents who are victims of school failure see little difference between children who choose schooling but do not continue to higher levels of attainment and those who choose to remain in the village in the first place. Apart from the exodus from the rural areas, this pattern of social selection has other dysfunctional effects on rural communities. After failing to proceed with schooling, children return to the village but are no longer interested in herding cattle, tilling the land, or most other village activities.

The Abolition of School Fees and Its Impact on School Access

Throughout Kenya's colonial and postcolonial history, selective examinations and graduated school fees have played a central role in controlling educational demand by Africans. In fact, the European settler-dominated

⁶ John A. Nkinyangi, "Socio-Economic Determinants of Repetition and Early School Withdrawal at the Primary School Level and Their Implications for Educational Planning in Kenya" (Ph.D. diss., Stanford University, 1980), pp. 234-86.

colonial government used both elements not only to control educational demand but also to minimize the numbers of Africans who progressed upward. In the late 1940s and early 1950s, the Beecher Committee report on African education based its recommendations on a 50 percent rate of wastage. The grading of classes and schools and the provision for expansion were based on the assumption that of the pupils who entered primary school, 50 percent would drop out by the end of the first 4 years. Four-fifths of those who remained were then to be eliminated by examination, and only for the rest were places to be found in upper primary. At this level, 50 percent were again expected to drop out or, if they did not, to be eliminated by another examination.⁷

The colonial government hoped that school cesses (fees) would have the effect of " . . . reducing irresponsible requests for schools . . . [and of testing and making] real the demand for education by making it vary directly with the willingness to pay at least some proportion of the cost that is required."⁸

The impact of educational costs on access and school progression during the colonial period should be seen against the background of severe impoverishment and marginalization for the majority of Africans.⁹ Moreover, during this period the families with the means to afford an education for their children had generally responded to educational opportunities, become actively involved in the market economy, and developed contacts, sometimes through intermarriage, with the influential figures in the government and the church.¹⁰

Despite the abolition of the notorious Common Entrance Examination which eliminated a majority of Kenyan children from school at the end of the fourth grade, selective examinations and graduated school fees continued to play their historical role in postcolonial Kenya. In particular, the issue of educational costs still remains a thorny political problem. At the time of independence in 1963, the government promised free primary education. The promise, however, was never kept, and throughout the 1960s and early 1970s the issue of school fees played a central part in Kenya's politics. During this period we therefore see much fluctuation in school enrollments as relatively poorer parents withheld their children from school, anticipating the abolition of fees.

⁷ L. J. Beecher (chairman), *African Education in Kenya: Report of a Committee Appointed to Inquire into the Scope, Content and Methods of African Education, Its Administration and Finance, and To Make Recommendations* (Nairobi: Government Printer, 1949); cited in R. W. Mutua, *Development of Education in Kenya: Some Administrative Aspects 1846-1963* (Nairobi: East African Literature Bureau, 1975), pp. 110-11.

⁸ Kenya, "Report of the Committee on Grants-in-Aid for Education in Kenya, 1925," cited in Mutua, p. 139.

⁹ E. A. Brett, *Colonialism and Underdevelopment in East Africa: The Politics of Economic Change 1919-1939* (London: Heinemann, 1974), pp. 98-99.

¹⁰ J. Forbes Munro, *Colonial Rule and the Kamba: Social Change in the Kenya Highlands 1889-1939* (Oxford: Clarendon, 1975), p. 159.

In 1974, however, the government made some gestures toward dealing with the issue of school costs. It decreed that it had "abolished" fees in the first 4 years of primary school. In the remaining three grades fees were to be reduced annually, culminating in free (but, note, not compulsory) 7-year primary education by January 1980.

I contend that these were merely cosmetic measures, for a number of reasons. First, in the context of the unequal society which has prevailed since independence, this action was just a perfunctory gesture toward the less privileged classes.¹¹ Second, this political gesture was rendered even less useful by the fact that at the time of the so-called abolition of school fees no fiscal countermeasures were taken to find ways and means of replacing the lost revenue. The government announcement naturally led to an influx of students into primary schools all over the country. However, access was soon cut off again. The new crop of pupils had to discontinue schooling after school committees decided to impose a whole new series of school fees under new names: equipment levy, building fund, activity fee, and so on. The building fund was the most regressive because of its magnitude.

The building fund was never considered a permanent feature, only a purely spontaneous reaction to an emergency. However, even if this levy were able to raise enough funds to put up new facilities, it seems no consideration had been given to how long it might take to collect funds or to erect new facilities when such funds were available. The government hid behind such ambiguities, only too happy that enterprising school committees had got off the hook with the introduction of a building fund.

Even if the abolition of school fees had been real enough, it did not affect the privileged and elitist school system which the Europeans had set up for their children during the colonial period and which the African upper classes appropriated for their children at the time of independence.¹²

On analysis, it can be said that the action supposedly abolishing school fees constituted a grave contradiction. On the one hand, the government was portrayed as seriously intending to improve educational access and raise school retention figures. In so doing, the government stood to reap major ideological dividends of credibility for its meritocratic philosophy.¹³

¹¹ Please see n. 5 above for historical background. On national days, the government makes many such gestures, e.g., abolishing school fees, decreeing higher commodity prices for agricultural produce, raising public sector employment.

¹² In Nigeria, David Abernethy also found that the ruling classes maintained a fee system in order to reserve the best schools for their children (Abernethy, *The Political Dilemma of Popular Education: An African Case* [Stanford, Calif.: Stanford University Press, 1969], pp. 246-47).

¹³ The meritocratic ideology on which social justice in Kenya is based makes social divisions palatable by cleverly substituting the idea of social equality for the idea of equality of opportunity. The educational system mirrors this ideology and uses examinations to select, promote, and confer rewards. For an official statement of the general ideology, see Kenya, *Development Plan, 1974-78* (Nairobi: Government Printer, 1973), p. 3. For a demystification of this ideology in regard to educa-

On the other hand, improved educational access did not come to pass because the government did not announce any fiscal countermeasures to replace lost school revenue. The government wanted both to eat its cake and to keep it. Hence, we find that the immediate effects of the government's intervention, and the implications arising from it, were to make primary school education much more expensive for the social classes who could least afford it.

In fact, *Educational Trends 1973-77*, a government document published recently, concedes that the abolition of school fees "did not completely inaugurate an era of free schooling"; from 1974, an equipment levy was introduced and "in addition many primary schools imposed supplementary fees for such items as building funds, activity costs, uniforms, feeding schemes, etc."¹⁴ The government document estimates that such charges raised about (Kenyan) £12.5 million (ca. US\$28 million) in 1976 or, on the average, added an additional (Kenyan) Sh 30 (ca. US\$3.40) to the cost of sending a child to school. My own data from the same period indicate that this is an underestimate. I found that where fees for the majority of schools were formerly standardized at Sh 60 (ca. US\$6.70), after the abolition of school fees and the resultant institution of new levies across the country, the cost of schooling as much as quadrupled in certain districts. Moreover, field surveys in more than half the country's 41 districts during school years 1978 and 1979 showed that no clearly defined criterion determined how these fees were set. As a result, there was wide variation between the amounts charged in different districts, in schools of different types, and in rural and urban areas.

Although official propaganda has made much of the government's intervention, and Kenyan mass media have taken to talking of the abolition of school fees as if it were genuine, I shall provide concrete evidence that the government action left much to be desired in terms of increased school access and progression. This is important in evaluating the impact of public policies as well as gauging the possible side effects of such interventions in a society.

Table 1 shows primary school enrollments by district as a percentage of estimated school-age population for the period of 1970-78. Some precautionary remarks about the data presented on this table: overenrollment (i.e., enrollment figures of over 100 percent) may result from: (1) The presence of overage children because of late registration or persistent repetition, particularly in upper-primary grades because of pressures of secondary school selection; (2) pupils' migrating across district lines; or (3) inaccuracies in school-census data or population projections of school-age

tion, see John Nkinyangi, "Material, Pedagogical and Socio-Psychological Differences in Kenya's Primary Schools and Their Impact on Educational Outcome," *Development and Change* 12 (October 1981): 547-78.

¹⁴ Kenya, *Educational Trends 1973-77* (Nairobi: Central Bureau of Statistics, 1980), p. 8.

children. My considered opinion after discussions with Ministry of Education officials is that only the first two explanations are of any major consequence, and fortunately these tie in well with the main concerns of this paper.

The data show that in the period before 1974 only a few relatively wealthier districts of the Central, Eastern, Rift Valley, and Western provinces were registering above 80 percent of their school-age cohorts. Even this percentage should be qualified in the light of the existence of many over-age children in the educational system. At any rate, the districts exhibiting relatively higher enrollment figures are those with backgrounds of early contact with schooling through missionary activity and also with relatively higher incomes on account of extensive involvement in the monetary economy through production of cash crops and other income-generating activities. The rest of Kenya's districts have enrollment rates which range from 10-40 percent in most of the arid and semiarid pastoral districts, to 41-79 percent in the majority of the country's agricultural districts.

In absolute terms, enrollment rates increased substantially in 1974. These changes were greatly influenced by each district's level of socioeconomic development. Naturally, the rate of increase over the previous year was lowest in the relatively wealthier districts of Central Province, which were registering higher school-age cohorts than the rest of the country even before the government's intervention. The rest of the agricultural districts had increases up to 50 percent over the previous year. However, in the arid and semiarid pastoral districts, increases were either nil or less than 10 percent. Overall, annual increases in primary school enrollment from 1969-73 ranged from 7 to 11 percent per annum whereas in 1974 the rise in enrollment amounted to 51 percent over the previous year.¹⁵

The increase in enrollments in 1974 occurred mainly, but not entirely, in grade 1. Enrollments here went up by 145 percent for boys and 161 percent for girls over the previous year. There were also increases in other grades in 1974 over and above the normal increases due to the promotion of pupils after wastage (repetition and dropouts) has been discounted. This trend reflects the return of pupils who had previously dropped out of school. Table 2 presents data on rates of increase on enrollments in grade 1 between 1970 and 1977. Except for the arid and semiarid pastoral districts, nearly all districts have heavy increases over the previous year. The 1974 increases, however, were not repeated in most districts in subsequent years.¹⁶ This statement could be interpreted to mean either that all school-age children in Kenya were in school or that many who joined during the 1974 influx soon dropped out and that access to schooling had reverted to

¹⁵ *Ibid.*, p. 7.

¹⁶ *Ibid.*, p. 9.

TABLE I
KENYA: PRIMARY SCHOOL ENROLLMENTS AS PERCENTAGE OF ESTIMATED SCHOOL-AGE POPULATION (6-12 Years)

Province and District	1970	1971	1972	1973	1974	1975	1976	1977	1978
Central:									
Kiambu	102	109	110	116	136	131	136	132	131
Kirinyaga	71	76	84	110	125	125	128	114	120
Murang'a	102	107	111	118	140	138	141	134	134
Nyandarua	89	95	102	109	124	132	131	117	120
Nyeri	105	109	115	119	133	136	141	134	133
Coast:									
Kilifi	36	35	41	42	67	63	68	63	62
Kwale	37	38	42	44	77	77	78	72	70
Lamu	32	29	34	55	98	126	132	152	126
Mombasa	65	64	67	67	75	74	72	70	68
Taita-Taveta	79	80	78	86	109	114	116	109	113
Tana River	39	45	45	35	61	72	70	62	58
Eastern:									
Embu	75	77	88	94	120	121	125	122	123
Isiolo	51	62	49	57	67	69	77	63	65
Kitui	68	64	69	75	109	108	110	111	115
Machakos	91	100	98	104	143	145	147	140	139
Marsabit	27	31	38	36	41	46	44	41	45
Meru	67	70	78	78	105	105	99	100	100
Nairobi:									
Nairobi	78	83	84	87	87	89	90	85	82
North-eastern:									
Garissa	14	17	16	18	20	19	20	18	16
Mandera	5	5	7	10	17	10	11	12	12
Wajir	6	9	10	13	13	13	13	19	18
Nyanza:									
Gusii	54	58	60	67	120	128	121	104	90
Kisumu	44	53	56	57	111	110	93	89	86
Siaya	63	64	69	69	114	118	115	108	82
South Nyanza	43	41	43	42	96	90	77	81	72
Rift Valley:									
Baringo	41	43	54	59	92	103	103	117	91
Elgeyo Marakwet	38	44	47	51	83	90	94	85	95
Kajiado	45	51	55	59	67	79	81	87	82
Kericho	16	46	43	48	80	82	93	87	85
Laikipia	67	83	91	102	127	137	146	148	150
Nandi	54	58	63	64	109	118	121	113	100
Nakuru	48	68	74	158	116	122	132	127	131
Narok	27	30	34	34	49	60	61	58	64
Samburu	15	20	22	22	26	25	28	26	27
Trans Nzoia	46	60	56	69	128	139	140	127	127
Turkana	6	6	8	10	15	12	11	11	1
Uasin Gishu	42	53	47	55	90	94	101	101	109
West Pokot	20	28	38	38	62	60	66	71	66
Western:									
Bungoma	75	70	75	75	125	125	123	127	147
Busia	66	56	63	62	110	114	113	110	100
Kakamega	69	69	80	82	123	130	138	130	103

SOURCES.—Enrollment data from Ministry of Education Annual Reports (Nairobi: Government Printer, 1970-77). 1978 figures estimates from education officials. School-age population based on district population projections, 1970-80, *Kenya Statistical Digest* 10, no. 3 (September 1972): 5-7, table 6.

TABLE 2
KENYA: RATES OF CHANGE IN STANDARD I ENROLLMENTS, 1970-1977 (%)

Province and District	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77
Central:							
Kiambu	7	1	4	20	-5	5	-4
Kirinyaga	5	8	26	15	0	3	-14
Murang'a	5	4	7	22	-2	3	-7
Nyandarua	6	7	7	15	8	-1	-14
Nyeri	4	6	4	14	3	5	-7
Coast:							
Kilifi	-1	6	1	25	123	-122	-5
Kwale	1	4	2	33	0	1	-6
Lamu	-3	5	21	43	28	6	20
Mombasa	-1	3	0	8	-1	-2	-2
Taita-Taveta	1	-2	8	23	5	2	-10
Tana River	6	0	-10	26	11	-2	-8
Eastern:							
Embu	2	11	6	26	1	4	-3
Isiolo	11	-13	8	10	2	8	-14
Kitui	-4	5	6	33	-1	2	1
Machakos	9	-2	6	39	2	2	-7
Marsabit	4	7	-2	5	5	-2	-3
Meru	3	8	0	27	0	-6	1
Nairobi:							
Nairobi	3	-1	2	2	-1	1	-2
North-eastern:							
Garissa	3	-1	2	2	-1	1	-2
Mandera	0	2	3	7	-7	1	1
Wajir	3	1	3	0	0	0	6
Nyanza:							
Gusii	4	2	7	53	8	-7	-17
Kisumu	9	3	1	54	-1	-17	-4
Siaya	1	5	0	45	4	-3	-7
South Nyanza	-2	2	-1	54	-6	-22	4
Rift Valley:							
Baringo	2	11	5	33	11	4	10
Elgeyo Marakwet	6	3	4	32	7	4	-9
Kajiado	6	4	8	8	12	2	-4
Kericho	30	-3	5	32	2	11	-6
Laikipia	16	8	11	25	10	9	2
Nandi	4	7	1	45	9	3	-8
Nakuru	20	6	84	-42	6	10	-5
Narok	3	4	0	15	11	1	-3
Samburu	5	2	0	4	-1	3	-2
Trans Nzoia	14	-4	13	59	11	1	-13
Turkana	0	2	2	5	-3	-1	0
Uasin Gishu	11	-6	8	45	4	7	0
West Pokot	8	10	0	24	-2	6	5
Western:							
Bungoma	-5	5	0	105	0	-2	4
Busia	-10	7	-1	48	4	-1	-3
Kakamega	0	11	2	41	7	8	-8

what it had been before the government's intervention. The first claim is simply not true in view of the fact that it can be observed from table 1 that many districts were not enrolling their eligible school-age cohorts years after the government's intervention. The second claim is partially supported by the data in table 3 presenting comparative dropout rates by district in grade 1 for the years 1970-76. Again, these figures appear to be closely related to a district's socioeconomic development: dropout rates are relatively lower in the municipalities and in the relatively wealthier agricultural districts of Central Province and the Rift Valley than they are in the other agricultural districts. They are extremely high in the arid and semiarid districts of the Coast, Eastern, North-Eastern, and Rift Valley Provinces.

The data in table 3 demonstrate the caution with which we should interpret rank-ordered statistics, especially in the light of the government's intervention abolishing school fees. High dropout rates in the lower-primary grades are reason enough to be extremely cautious in interpreting league statistics, which may be used to minimize or downplay regional disparities in schooling access and progression. In this regard, the government document *Educational Trends 1973-77* is still able to conclude that "although the abolition of school fees enabled the government to achieve considerable progress towards its goal of attaining universal primary education, the policy initiative was, however, less successful in narrowing the gap between the districts with the highest and lowest attendance."¹⁷

The Case of Low Educational Participation Rates in the Arid and Semiarid Districts

Educational participation has been particularly disappointing in the arid and semiarid districts of Kenya, which follow a nomadic life-style. This is a matter of serious concern in terms of prolonging the historical disparities that perpetuate regional imbalances and threaten interethnic strife.¹⁸ The *Kenya Development Plan, 1970-74*, describes the situation in these districts:

All areas in Kenya, particularly those with widely scattered populations, have not participated equally in the recent rapid expansion of primary education. Less than 50 percent of the total primary school age population are enrolled in schools in Baringo, Samburu, West Pokot, Turkana, Kajiado, Narok, Wajir, Mandera, Garissa, Isiolo, Marsabit, Tana River and Lamu districts.

In most of these districts, enrolments will have to rise very rapidly in the next Plan period [i.e., 1970-74] if the country is to reach the national target of 75 percent of the primary school age population enrolled in 1974.

¹⁷ *Ibid.*, p. 11.

¹⁸ W. T. S. Gould, "Secondary School Admission Policies in Eastern Africa: Some Regional Issues," *Comparative Education Review* 18 (October 1974): 374-87.

As these districts are among the poorest in the Republic, Government will encourage primary school attendance by providing boarding facilities in each of the mentioned districts. Government will also survey these districts and where necessary and practicable, improve and extend existing facilities.¹⁹

Except for Lamu, Baringo, Elgeyo-Marakwet, and Kajiado, which seem to have exceeded the government projection of enrolling 75 percent of school-going age, the districts named by the government were far below that expectation 8 years later, in 1978. Moreover, as we pointed out in the preceding discussion, there is reason to doubt whether in fact the four districts have exceeded the official projection, because of high grade-repetition rates, especially in upper primary, and interdistrict migrations of pupils.²⁰

We will discuss interdistrict migrations in greater detail as we examine the impact of another government policy intervention: the provision of boarding school facilities in the arid and semiarid areas of the country. In fact, although boarding schools were officially launched during the 1970-74 Development Plan period, the government was already beginning to lose faith in these institutions by the time of the 1974-78 plan.

During the 1970-74 Plan period, the government attempted to encourage primary education by providing boarding facilities at selected schools in these areas [i.e., pastoral areas]. The experience to date is that *the cost per pupil has been extremely high and the actual response has been disappointing in terms of increased enrolment by people indigenous to those areas*. Therefore, the government will reduce the scope of this particular programme substantially until its effectiveness has been demonstrated. The government, however, intends to test alternative means of promoting education in these areas. A new programme of *Mobile Teaching Units* especially designed for areas with these particular problems will be tested on a pilot basis during the Plan period. The government remains committed to the long-term goal of increasing the educational facilities in remote, sparsely populated areas to the level of other more advanced parts of the country. *However, it recognizes that its scarce resources must be utilized with maximum effectiveness.* [Emphasis added]²¹

Analysis of policy incentives to improve educational access and school retention in relatively remote areas exposes many contradictions which summarize social relations in Kenyan society and at the same time demonstrate the prevailing ideology of blaming the victims for the failure of official policies. I will illustrate this by showing how development

¹⁹ Kenya, *Development Plan, 1970-74* (Nairobi: Government Printer, 1969), p. 454.

²⁰ In the early 1970s many Kenyans expelled from Tanzania when relations between the two countries worsened were resettled in Lamu. For evidence of incursions into the Masai districts of Narok and Kajiado, see Kenneth King, "Development and Education in the Narok District of Kenya: The Pastoral Maasai and Their Neighbours," *African Affairs* 71 (October 1972): 389-407.

²¹ Kenya, *Development Plan, 1974-78*, p. 412.

TABLE 3
KENYA: INTERDISTRICT VARIATIONS IN DROPOUT RATES, 1970-76 (%)

Province and District	1970	1971	1972	1973	1974	1975	1976	Average
Central:								
Kiambu	12	1	9	13	17	6	4	9
Kirinyaga	7	10	11	15	18	9	8	11
Murang'a	11	9	6	9	11	5	5	8
Nyandarua	19	8	10	9	7	10	11	8
Nyeri	10	9	12	12	11	8	6	10
Thika Municipality	25	8	0	8	15	-7	11	3
Coast:								
Kilifi	25	6	26	29	32	17	26	23
Kwale	28	19	22	24	25	18	17	22
Lamu	5	9	-29	3	23	-41	10	9
Mombasa	4	-1	0	5	9	6	-3	3
Taita-Taveta	13	19	6	11	15	9	5	11
Tana River	21	38	51	43	34	30	33	36
Eastern:								
Embu	11	2	13	17	20	12	10	12
Isiolo	27	46	13	23	32	20	36	28
Kitui	17	5	7	15	22	13	8	12
Marsabit	17	15	38	29	20	15	12	21
Masaku	-7	16	7	14	21	14	13	11
Meru	15	10	18	22	25	27	11	18
Nairobi:								
Nairobi	-2	2	0	2	4	4	3	2
North-eastern:								
Garissa	32	40	4	27	40	20	28	29
Mandera	22	27	-25	22	69	19	18	22
Wajir	-13	34	4	3	21	-13	-48	-3
Nyanza:								
Gusii	3	10	0	11	21	26	24	14
Kisumu District	2	-5	1	14	26	37	6	12
Kisumu Municipality	8	-1	1	2	2	5	1	3
Siaya	11	5	19	24	28	17	13	17
South Nyanza	19	11	11	25	39	37	7	21
Rift Valley:								
Baringo	4	-18	8	17	26	24	14	11
Nakuru District	4	2	8	15	21	8	9	10
Kericho	15	22	6	17	27	9	21	17
Laikipia	-4	40	-67	-24	20	9	9	-2
Nakuru Municipality	8	-55	36	28	19	10	5	7
Narok	15	12	32	30	27	29	18	23
Kajiado	-4	10	17	16	15	18	2	11
Samburu	2	19	34	39	44	24	42	29
Elgeyo Marakwet	-7	6	3	17	30	24	28	14
Nandi	20	23	26	28	30	27	27	26
Trans Nzoia	13	2	13	23	33	21	12	17
Uasin Gishu	8	8	13	17	21	14	13	13
West Pokot	-16	17	34	37	40	26	25	23
Turkana	48	21	33	47	60	24	31	38
Eldoret Municipality	4	40	-24	-14	-4	-5	1	0
Kitale Municipality	38	17	9	5	1	20	5	16
Western:								
Bungoma	23	9	22	28	33	26	18	23
Busia	41	2	21	25	28	25	26	24
Kakamega	16	0	14	16	18	8	5	11

NOTE.—In statistical computations, negative dropout rates appear as a result of interdistrict migrations of pupils or as a result of unreported repetition (usually in the upper-primary grades). The magnitude and the direction of these migrations are issues of great policy significance and political ramifications.

policies are decided and by discussing educational costs in the boarding schools.

In relatively remote areas of the country, it seems that most policies, especially those relating to the development of education, are decided by trial and error.²² This is easily illustrated by the way planners' and policy-makers' enthusiasm leaps from one untested proposition to another. Some examples are in order.

When the boarding school program was found not to be working well, planners enunciated their desire to experiment with mobile schools. This maverick innovation is just what the name suggests—schools on wheels! Quite apart from the number of mobiles needed to traverse the arid lands (73,000 square miles with 10–20 inches of rain annually and 60,000 square miles with less than 10 inches), this plan assumed that nomads follow predictable routes and that these routes are drivable in the first place. Planners then had the idea of recruiting itinerant teachers to accompany pastoralists and ministering to their educational needs. Finally, faith in boarding schools reawakened and the Kenyan Government, with assistance from the World Bank, was willing to invest another Sh 60 million (ca. US\$671,000) in financing 12 additional centers in the arid areas.²³ The new policy orientation at this juncture was that the installations were to serve as a supermarket of educational prescriptions, offering formal education to pastoral children by day and nonformal education to their parents at night.

Concerning educational costs, the government laments that the cost per pupil has been extremely high in the schools that it set up for pastoralists. What the policymakers actually mean is that the cost of running these installations, officially dubbed low-cost boarding schools, is high compared with the ordinary community-supported day schools that dot the Kenyan countryside. The government statement does not mention that the state also supports two other types of boarding schools (medium- and high-cost schools for more privileged members of Kenyan society) which cost much more to run and maintain.²⁴ Field surveys in 1978–79 show that in medium-cost boarding schools the government spends more than twice as much as it spends in low-cost boarding schools providing food alone, and in high-cost boarding schools more than three times as much. The

²² John A. Nkinyangi, "Education for Nomadic Pastoralists: Development Planning by Trial and Error," in *The Future of Pastoral Peoples: Proceedings of a Conference Held in Nairobi, Kenya, 4–8 August 1980*, ed. J. G. Galaty, D. Aronson, P. C. Salzman, and A. Chouinard (Ottawa: International Development Research Centre, 1981), pp. 183–96.

²³ Personal communication with officials, Nairobi, 1978.

²⁴ Medium-cost boarding schools are one of the postindependence developments which attest to social differentiation in the Kenyan society. These schools were established to fulfill the needs of the richer peasants and other relatively privileged classes in the rural areas. High-cost boarding schools were the institutions which existed in the settler enclaves to serve the children of the Europeans. After independence, the ruling classes appropriated them for their children. In a number of rural areas, there also exists a system of private boarding schools which were developed to serve the educational needs of the nascent middle classes and rich peasants.

government also employs additional staff (e.g., matrons, substitute mothers, bursars, clerks, secretaries) and allocates funds running into thousands of pounds sterling for individual schools, for such items as maintenance, transportation, electricity and water, uniforms, and improvements. These services are unheard of in low-cost schools.

Moreover, in the low-cost schools, children are expected to bring their own beds, bedding, and cutlery. The cost of these items and the additional burden of a boarding fee of Sh 180 (ca. US\$20.20) per annum, is a serious barrier to the smooth participation of pastoral children in these installations. Hence, official statements like, "... a substantial proportion of the population in these [pastoral] areas is not fully aware of the social and economic benefits that result from the education of their young people,"²⁵ simply fly in the face of facts. This kind of statement is part of the ideology which seeks to blame the victims. During the colonial period, this ideology was used against pastoral peoples.²⁶ Since independence, it has been used either to excuse past inaction or to rationalize the half-baked official policies we discussed earlier. My position is that lack of development of the main economic resource of the pastoral people, livestock, makes it difficult for them to participate in social programs which cost money.²⁷ This simple economic fact explains much of these peoples' difficulty in paying boarding school fees and other educational costs, and by extension, explains low educational participation rates in these areas. The ultimate irony is that the government considered the nominal fee of Sh 60 formerly charged in most primary schools a burden to most parents and yet maintains boarding fees of more than Sh 180 in schools meant to uplift enrollments and improve school retention in pastoral areas.

Field investigations show that many pupils from other districts (often the down-country agricultural districts) enroll in boarding schools meant for pastoral children. Curbs on grade repetition in upper primary account for most of the interdistrict migration of pupils, as parents and children seek to bypass official rules. (Attempts to beat the rules include changing names to avoid detection when pupils file for a second chance in the secondary school selection exam.) Evidence from the field shows that these migrations are into the arid and semiarid pastoral districts and are as much as 15 percent in some districts. This is a very serious policy problem, especially in districts which already have very low enrollment rates. At the

²⁵ Kenya, *Development Plan, 1974–78* p. 42.

²⁶ R. M. A. van Zwanenberg with Anne King, *An Economic History of Kenya and Uganda 1800–1970* (London: Macmillan, 1975), pp. 79–109.

²⁷ With assistance from the World Bank and a number of other international aid organizations, the Kenyan government initiated a number of livestock programs in the arid and semiarid districts. These projects, however, are generally considered to have failed their originally stated beneficiaries. For some evaluations, see Uma Lele, *The Design of Rural Development: Lessons from Africa* (Baltimore: Johns Hopkins University Press, 1975); and Joseph Collins and Frances Moore Lappé, "Mythe de l'aide aux plus pauvres et 'piège de l'endettement': la banque mondiale et le 'développement' agricole du tiers monde," *Le Monde diplomatique* (June 1979), p. 29.

base of these interdistrict migrations, which in effect preempt the places of pastoral children, is the desire of the agricultural people not only to improve their children's chances for selection into government secondary schools but also, more specifically, to take advantage of policies favoring the pastoral areas—boarding school facilities and preferential selection into secondary schools. Such developments only contribute to the pastoral peoples' continued exploitation and reversals of fortunes. The full political ramifications of such actions can be expected to develop only in the future.

Conclusions

I have shown that there is reason to question the optimism occasioned by the so-called abolition of school fees in Kenya since 1974. I have argued that government policies meant to improve educational access and school progression have failed because their true impact was to raise schooling costs beyond most parents' ability to pay.

The Kenyan Government now acknowledges that "such increasingly compulsory contributions" as followed its 1974 abolition of school fees "contravened the intention of the Government to provide greater access to primary schooling."²⁸ Since 1978, the government has directed that collections from individual parents cease and funds to support primary schools be raised by local politicians, members of parliament, ministers, civil servants, and other individuals through *harambee* ("community self-help"). However, our field surveys in September and October 1980 showed that schools all over the country were still charging building fees and that, in objective terms, schooling in Kenya could not be termed "free." In fact, the existence of the problem is shown by the frequency of discussions of schooling costs and the number of decrees abolishing this or that fee.²⁹

More important, the government's present initiative to democratize primary schooling is likely to have very serious implications for the future. As historical analysis has shown, the effect of community initiative in educational development has been to give leading regions an even greater advantage over those which lag behind.³⁰ The present policy pits regions which have concentrations of moneyed classes against those which do not. In the end, this can only exacerbate existing regional disparities and possibilities of interethnic strife. In fact, the consequences of this policy are already visible in districts which are readily able to raise millions of shil-

²⁸ Kenya, *Educational Trends 1973-77*, p. 8.

²⁹ Despite his 1978 decree abolishing building funds and other school levies, the president was forced to make another order in January 1981; the problem had not gone away. See *The Standard* (Nairobi) (January 13, 1981), p. 1.

³⁰ See, e.g., J. Anderson, *The Struggle for the School* (London: Longmans, 1970); L. G. Cowan, *The Cost of Learning: Politics of Primary Education in Kenya* (New York: Columbia University Press, 1970); and David Court, "The Educational System as a Response to Inequality in Tanzania and Kenya," *Journal of Modern African Studies* 14 (December 1976): 661-90.

lings for their schools and in those which can muster only a few thousands or do not bother to conduct any fund raising at all.

My discussions should also show that compensatory policies to assist children from pastoral or underprivileged areas of the country cannot be said to have met officially stated objectives, since costs of government sponsored institutions are prohibitive for the majority of children indigenous to those areas. Moreover, I pointed out that the discovery by parents from other parts of the country that they could exploit these institutions to further their children's chances in secondary school selection is directly undermining the government's compensatory policies, in effect contributing to the continued exploitation of pastoral peoples. In ideological terms, the current Kenyan orthodoxy, which tries to explain away the excessive numbers of children from agricultural districts in the primary schools meant for arid and semiarid areas as "fostering national unity" between the agricultural and pastoral peoples, is a demonstration of incredible phlegm. The social and political hypocrisy behind this posture refuses even to acknowledge that interaction between pastoral and agricultural peoples is a one-way traffic.

UNIT B

Module 8

Objective(s):

- 1. Identify issues of teaching effectiveness.**
- 2. Identify factors which affect teaching effectiveness.**
- 3. Present policy options to improve teaching effectiveness.**

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Introduction

In recent decades, many developing countries have experienced a similar history in building primary education programs. A late start in universalizing primary opportunities and rapidly expanding school-age populations caused authorities to commit the major part of educational resources to expanding and staffing physical facilities. Spending for quality improvements was viewed as reducing the amount available for quantitative expansion. Further, there was a reluctance to divert scarce resources to improve quality because policy-makers lacked certainty about what interventions were likely to improve education programs. Eventually, with the strains of expansion, the quality of programs deteriorated, dropout and repetition rates increased, and the skill levels of children declined. Improvements of some kind became crucial if children were to stay in school long enough to consolidate the gains of expanded opportunities. Planners hesitated, however, to shift to investment in qualitative changes because of fears that such a shift would limit the resources available for expansion.

It now appears that the total resources available for both quantity and quality goals can be increased if efficiency becomes a priority of reforms, that is, if the effort exerted toward improving the quality of programs results in decreases in dropouts and repeaters. When this occurs, completion rates rise and the cost per graduate decreases, making it possible to use existing space and staff more economically without increasing costs. At the same time students learn more. One way to encourage children to spend the required number of years at the primary level is to raise achievement levels, thereby reducing failure rates. A key to this increase in achievement is the effectiveness of teacher instruction.

Issues in Improving Teacher Effectiveness

The major problems in improving teacher effectiveness include: 1) how to define "effectiveness," 2) how objectively to identify effective instructional practices, and 3) how to replicate proven effective behaviors in a variety of teachers. Once effectiveness is defined, the second two problems become largely methodological.

One of the most widely used definitions is one which measures school quality by achievement scores. School quality is defined as (a) the level of material inputs allocated to schools on a per-student basis, (b) the level of efficiency with which fixed amounts of material inputs are organized and managed to raise student achievement (Fuller 1985: 12). This is a value-added definition which stresses the difference made by the school or, more accurately, the teacher. In the absence of other easily acquired indicators reflecting educational objectives, achievement scores inevitably become the measure of choice in determining quality/effectiveness.

Achievement scores have certain limitations. They may measure a narrow range of skills, or measure lesson content rather than skill development, or reflect general socialization objectives. If devised locally, they may reflect many implicit understandings about education and educational products. Therefore, they may serve to test the capacity of the system to produce these results. Where the tests serve as promotional hurdles, achievement scores indicate how well a system is moving children through a series of grades at normal rates. In programs where children have high levels of repetition and dropout, this narrow view of effectiveness can serve as an interim goal until there is consensus on what other quality reforms need to be initiated. A secondary gain is that, as the system improves efficiency by raising achievement scores, it begins to develop the capacities for experimentation, evaluation, and replication. With these capacities it can achieve continuous improvements in quality.

Ultimately, definitions of effectiveness need to address broad goals of quality:

- What kind of person should the system attempt to produce;
- What basic skills are needed for the adult in this society;
- What are culturally appropriate ways to go about learning;
- What are valid and acceptable indicators that the program has been effective in reaching these goals;

- Who should determine the goals for effectiveness;
- How will the goals be implemented?

Many systems address these questions on a general level but fail to describe the implications of the answers in enough detail for them to be implemented and evaluated.

Factors Which Affect Teaching/Learning

Numerous factors affect the performance of teachers and learning outcomes.

Out-of-school factors, which usually cannot be affected by policy, are not discussed here. They are usually of three kinds: 1) **community factors**, 2) **family factors**, and 3) **student characteristics**. Community factors include demographic structures, labor force composition, degree of urbanization, social heterogeneity, and cultural characteristics. Family factors include socioeconomic status, size, values, and educational background. Student characteristics include health, nutrition, cognitive development, attendance stability, gender, previous schooling, etc. **Motivational factors** may occur at any of these levels, including local and family norms and values related to school-going, employment structures, student's feelings about attending, etc.

In-school factors, which usually can be affected by policy, include **physical resources, school management, teacher characteristics, training, time allocation, learning technologies, and curriculum.**

Physical Resources. Some of the factors included in this category include accessibility, size of school, condition of the buildings, general and academic facilities, school furnishings, and material resources. Most authorities assume the importance of minimal facilities for effective teaching/learning. In most systems, a location for schooling, usually in the form of a school building, is essential in order to generate the other resources necessary for teaching/learning to go on. These essentials include a teacher, and some minimal materials such as textbooks, blackboards, and writing materials.

Crowding, ventilation, and illumination may affect the comfort of students and the way teachers teach, but may not have enough effect to make a measurable difference in achievement scores. Similarly, class size is not consistently related in the literature to marginal changes in achievement. However, teachers usually feel it is easier to teach when there are fewer children in the classroom, and the abilities of children are similar. Class size may be important in one respect: where low densities (or lack of teachers) cause grades to be combined, there may be important variations in achievement. BRIDGES found significantly lower achievement in multi-grade as opposed to single-grade classes in Pakistan. This should be a correctable problem if teachers learn how to work with these conditions, and materials are provided that support appropriate learning in multigrade classes.

From BRIDGES research and other sources, there is no clear indication that facilities have a discernible impact on teacher performance. In Pakistan, there was little to differentiate the kinds of facilities available to effective teachers from those available to less effective teachers. On the other hand, in countries where a scarcity of facilities forces double or triple shifting that cuts into the hours of instruction, lack of facilities may indirectly have an impact on achievement.

School Management. School management factors include headmaster characteristics, supervision policies, school organization, entrance requirements, leadership style, teacher turnover, and relations with the community. In the "Effective Classroom Practices Study" of Pakistani schools, student achievement was highest when headteachers were older, more experienced, from the local community, and taught in addition to doing headteacher functions. Because their roles were not clearly defined, each headteacher had his or her own idea of what the responsibilities included. Effective headteachers tended to emphasize their instructional and community relations roles more. In the less effective schools, headteachers were more likely to emphasize their administrative roles. Effective headteachers defined school policies more clearly and were more likely to emphasize educational goals. For example, effective headteachers were more likely to restrict admissions according to a specified set of guide lines, but were more likely to accept dropouts back unconditionally. Attention to such details reflects the more orderly school environment and the greater concern for academic goals which was observed in the effective schools. The larger BRIDGES survey, on the other hand, found no statistical significance between a number of headteacher characteristics and academic achievement.

Time Allocation. Time is an important element in effective teaching. Research has consistently shown the importance of time as an educational resource. According to research, learning is affected by how much time is made available during the school year, the school day, and the various stages of education. Learning is also affected by how much time is needed to learn a specific set of objectives; and how productively time is used. A number of factors affect both the quantity and the quality of time spent in learning. These include the number of students in the class, the way activities are organized, the amount of time in the school day spent in instruction, the engagement of students in learning tasks, and the attendance levels of teachers and students. Each of these factors can be affected by changes in policies.

BRIDGES studies in Pakistan have shown that there may also be optimum patterns in the proportion of time spent on each major instructional activity in the classroom. These optimum time patterns are subject to the subject matter being taught, the demands of the learning context, and whether the class is multi-grade or single-grade. Optimum patterns also have some tolerance for variation depending upon the needs of certain types of teachers. Female teachers in Pakistan, for example, tend to spend less time in formal presentation of materials and more time in interactional, monitoring activities than men.

Teacher Characteristics. Factors affecting learning outcomes include recruitment and placement policies, individual characteristics, training, certification, and working conditions. Personal characteristics which may prove important include sex, age, place of origin, residence, qualifications, capability, personality, discipline style, interest in students, etc. The general academic preparedness of teachers and the quality of their professional training has important implications for instruction. In the absence of practical training, teachers depend to a large extent on the models of teaching they themselves experience as students. Therefore, some teachers may perpetuate instructional practices which may no longer be suitable for current expectations of learning or the skills that need to be taught. Their capacity to teach may also be limited by an inadequate knowledge of the subject matter, especially when instructional materials are either unavailable or highly teacher-dependent. BRIDGES found, in Pakistan, that the length of a teacher's academic training was an important predictor of student academic achievement. No form of teacher training, by contrast, had impact on student achievement. In Pakistan, therefore, there is no point in spending more resources on the present forms of training. Resources would be better allocated to designing new training and rigorously evaluating its effectiveness.

Teacher motivation is an important ingredient of effective teaching. Teachers can be absent a great deal, especially in some countries with liberal conditions for "leaves of absence." Some teachers, though present in school, may waste time in non-instructional activities or leave the class in the hands of student monitors. Salary structures may be low and not attract the best candidates, or teaching may become an alternative career for those who cannot find other employment. Increasing the salaries of teachers is a difficult policy option to implement, especially when high proportions of recurrent costs are already invested in salaries. Many school systems do not have incentives to encourage teachers to want to perform better, or hold them accountable for learning in their students. Reporting systems may provide no means of assessing whether teachers are performing well or not. Similarly, civil service tenure, and automatic promotion systems discourage initiatives to perform well. Factors such as the teacher's place of origin and knowledge of local languages may affect motivation and patterns of absence. These factors may affect the compatibility of teachers, students, and parents in local settings. When teachers identify with students, they may be more likely to try to give them a meaningful learning experience. Similarly, they are 1) less inclined to travel to visit relatives, 2) more likely to come on time because they live locally, 3) able to stay on because they can survive on a limited salary, and 4) are more likely to remain for many years in the same school. Difficulties with non-local teachers can be avoided. An advantage to using local teachers is that there may be more local interest and control over schooling, as well as more contributions of resource generated from the community. Though the teacher-student fit may not be perfect, and central authorities may be threatened by strong local teachers, the benefits of hiring local teachers outweigh the disadvantages.

When school systems are sex-segregated, there is greater likelihood that differences will appear. Differences noted are in teaching patterns and mastery of certain subjects, depending on the sex of the teacher. Teaching styles may be affected by norms which affect gender characteristics in the society at large. BRIDGES found this to be true in Pakistan where female teachers spend less time in "presentational," and more time in "interactive," activities, than male teachers. Probably sex role expectations in Pakistani society call for women to be more nurturant, informal, and interactive, and for men to be more assertive, formal, and presentational.

Classroom Management. The way teachers organize resources in classrooms is an important determinant of learning. In this regard, what is important is:

- teacher instructional strategies: how they assign tasks, group children, use instructional technologies, and use language;
- teacher attitudes about their students: how they give feedback, prompt students, assess student learning;
- teacher organization of time: how they pace lessons and monitor learning.

A fixed amount of inputs to the classroom can be converted into vastly different learning outcomes depending upon the teacher and the capabilities of the students. In many systems the teacher is good not because of specific training, but because the teacher responds intuitively to the children's needs and to effectively carrying out a learning process. Many learning practices have logical implications for reinforcing or obstructing learning. Such practices are how a teacher calls on students, for example, selectively, systematically, or randomly, and how a teacher reinforces learning in different students. Teacher-training courses need to make their students aware of a repertory of teaching practices, their implications for learning, and their suitability for given contexts. The optimally effective teacher adjusts instruction to:

- the requirements of the subject matter,
- the audience,
- the conditions of the learning environment, and
- the expectations of the system.

BRIDGES found teaching practices in Pakistan which appeared to be associated with variations in achievement levels. Effective practices utilize a combination of behaviors that together make up something which is more than the sum of its parts. Introducing isolated practices will not, therefore, have as much impact as introducing a package with many key elements. Similarly, variety appears to be a key ingredient in effective teaching. That is, it is better to approach the activity of learning from a number of directions. A single practice contributes to learning up to a point in a lesson, after which it loses its potency. Then it becomes better for teachers to use other means of reinforcing that point. Often, seemingly repetitive activities (copying from

the blackboard, repeating paragraphs from the text, rewriting more neatly) appear to be effective practices. Alone, these practices may have little impact on achievement but in conjunction with other practices, they prove exceedingly useful in reinforcing learning.

In Pakistan another ingredient of effective instruction is using systematic logical sequences. Much of learning naturally builds in steps, one leading to another. A generic sequence that proved effective included:

- preparing a knowledge base through review;
- focusing attention on a clear teaching objective;
- presenting new materials in small steps;
- supervising initial practice closely;
- allowing time for children to master the material independently;
and
- adding practice through homework.

Effective teachers were not only more likely to use such logical sequences, but were also more likely to use these particular behaviors than less effective teachers. A synthesis of research on pedagogy endorses the use of sequences for, "teaching any well-structured discipline where the objective is to teach performance skills or mastery of a body of knowledge."¹

Effective teaching is a contextual phenomenon. What are effective practices in one subject, or with one age group, may not work in another subject or setting. What is comfortable for one kind of teacher may not be for another. Most of these factors can be discovered by systematic studies of classroom practices in specific locales using achievement as a performance measure. Teacher-training courses then can teach a combination of generic "instructional learning sequences," which fit well in a particular sociocultural context, and are appropriate for teaching certain types of skills. Teachers need to be taught to expect difference and know how to adjust instruction to suit varying needs.

¹ B. V. Rosenshine, "Synthesis of Research on Explicit Teaching," Educational Leadership (April 1986: 60-69: 60).

Learning Technologies. Learning technologies include textbooks, tests, charts, blackboards, globes, writing materials. Research has shown textbooks to be significant in increasing achievement, especially when they have not previously been available. They make it possible to expand the time students spend on learning tasks. They make learning less "teacher-dependent," and they make it easier to accomplish national standards of education.

The kind and quality of materials restrict the way they can be most appropriately used. Materials which are too difficult or are too teacher-dependent, limit the way a teacher may use them. When lessons have to fit defined time periods, teachers have difficulty varying instruction to the topic or to the abilities of the students.

Improving Teacher Performance

Without clear indicators of quality, national programs to improve school quality can start with the narrower "quality" goal of reducing student wastage. With this approach, improvement is seen as an incremental, continuous process. It starts with the mission of developing greater efficiency in existing systems, and moves toward other quality goals as these become defined. The key to solving the problem of wastage appears to lie in improving the performance of teachers. Given the existence of promotional hurdles in most systems, improvements in student achievement levels is the most likely way to keep children in school and progressing through the grades at a normal pace.

For most educational systems, innovations directed toward improvements in teacher performance require comprehensive changes. These include:

1. **more effective teacher training**, with practical courses keyed to the context of learning and the availability and kinds of materials;
2. **classroom support for teachers**, especially those weak in qualifications or with especially difficult multi-grade and large classes;
3. **materials which are less teacher-dependent** to compensate for the uneven quality of teachers and to allow for more self learning where abilities differ or classes are large;

4. simplified curriculum and instructional materials in the early grades geared to developmental needs of children;
5. incentives for teachers to improve student learning; and
6. assessment instruments to allow teachers and planners to know and correct for the extent to which students learn what was expected.

When these components are well developed and articulated, it is likely that the quality of teaching/learning will improve. When they are poorly developed and articulated, instructional quality is likely to suffer. It is not enough to improve even some of these components in isolation from the others. At the same time, the effort can be kept manageable in terms of resources and staff. This can happen by orchestrating educational reform around teaching practices and materials that have demonstrated potential to raise achievement.

Lessons from past attempts at reform have taught that to sustain and encourage improvements, it is necessary to:

- reinforce changes at the classroom level with reminders, incentives, and materials that encourage "effective" teaching;
- coordinate the components of programs so they support each other, focusing materials, supervision, management, and teaching on the same qualitative outcomes;
- develop means by which experiments with innovations can continue as a function of existing education departments;
- provide the mechanisms by which innovations can be rigorously evaluated, modified, and changed; and
- provide systematic ways to disseminate tested innovations so they are utilized effectively.

Policies which can sustain innovations need to be brought in line to reinforce them.

Innovations need to be: 1) possible under normal conditions in defined classroom contexts, 2) effective according to objective measures, and 3) consistent through initial and later stages of implementation. Short, proven practical courses with supportive materials would better serve for in- and pre-service training of teachers. Practical courses are more effective than courses with elaborate theoretical training designed to increase teacher knowledge of the background of education. These theoretical courses may be added when a practically qualified corps of teachers has been developed.

Ease of implementation requires the innovations to be compatible with "deep structure" cultural assumptions about teaching/learning. Innovations should also be limited in scope in the initial stages to what is needed to effect higher achievement (so as not to challenge entrenched educational departments or bureaucracies all at once). It takes time to establish an attitude which accepts empirical evidence of success as the basis for change and use research as a base for program evaluation.

Improving the quality of teaching is different from expanding educational opportunities for students. Quality cannot be mandated simply by varying resource levels or fixing on isolated inputs. More important is the quality of the inputs and the way inputs are articulated and managed. Producing concrete results in learning is a complex problem that needs complex but not necessarily expensive solutions.

Policy Recommendations and Relevant Considerations

Certain policy options appear more often to positively affect learning outcomes. The policies come from a review of BRIDGES experience and from literature on instructional strategies and the allocation of learning resources (Montero-Sieburth 1989 for BRIDGES),

Some clear directions for policy initiatives are:

1. Sufficient instructional time needs to be made available to teachers. Some system must be devised to ensure that local authorities do not arbitrarily cut back that time by starting late or leaving early. School years should be scheduled so that there are not major interruptions that require time-consuming major relearning of school curricula.

2. There need to be stable teacher and student attendance patterns. Policy decisions which help to stabilize attendance levels will extend the time available for instruction. Teacher absenteeism can be reduced by appointing teachers closer to their homes and by increasing supervision. Supervision can be done by a head-teacher or someone nearby who is trained in the management of instruction. Bureaucratic measures such as salary disbursement need to be arranged so teachers do not need to leave their classes to get paid.

3. In- and pre-service training should be directed at helping teachers organize existing resources and time more effectively and efficiently. Effective utilization of time and materials depends on the teacher's ability to organize, pace, sequence, monitor and provide feedback to students. Though the amount of time spent on task is important, more important are the quality of the task and student engagement in the task. In this respect, all teaching practices have implications for learning that should be made clear to teachers, both in terms of learning impact and in suitability for various learning contexts. Teachers need a repertory of practices they can adapt to the context in which they teach. They also need to become aware of how their own behaviors model general social behaviors for children more vividly sometimes than the lessons of the text. Policy-makers should put these practical aspects of teaching at the core of training programs, rather than the highly theoretical, historical components that are now emphasized in many institutions. In some cases where training programs appear ineffectual, money would be better allocated to providing more general academic opportunities for potential teachers, while experimentation continues to find more effective training programs.

In Asia, one promising direction is to introduce distance in-service training into the cluster school setting so that all or most of the teachers in one area experience the training at the same time. This serves to control the quality of in-service training while bringing training closer to home, giving teachers a chance for more interaction, and also giving supervisors and managers opportunities for training that supports improvement. This activity would help to focus all personnel on the same major goals of educational quality (FORUM Nov. 9, 1989).

4. Teachers need incentives (such as status, professional or merit recognition) for bringing their students to a high level of learning. If nothing else, they need verification that their instruction has had an effect. When there are no obvious consequences to their actions, few teachers feel motivated to perform well. Students also need to be encouraged to feel they are gaining skill development and that they can successfully complete the work.
5. Textbooks are one of the most important ingredients in improving the quality of instruction. They help organize instruction toward specific objectives, allow more time to be spent in learning, and help compensate for the uneven quality of the teaching force. Improving their quality almost inevitably affects the quality of learning, especially in systems where there is heavy reliance on textbooks. Their impact depends on the extent to which teachers and students interact effectively with them. Therefore, a corollary of effective use requires explicit training in the best ways to use textbooks in the classroom.
6. Supportive instructional materials such as teacher guides, simple charts, and practice materials can help to make teaching easier. Before resources are put into these supports, however, educators need to endorse their usefulness in promoting educational objectives, and teachers need to be trained in how to use them. When used properly, guides or annotated texts can ensure a more uniform quality to teacher performance. Teacher manuals and guides also can put a minimum base under less qualified teachers.
7. Assessment systems need to be keyed closely to the objectives of the educational program. Whether intended or not, tests drive the system, and indicate a great deal about what children will be learning. A thorough review of the assessment system must be one of the first steps taken to initiate reforms in the quality of instruction.

Conclusions

BRIDGES work in Thailand recommends a two pronged approach to improving learning: balancing an accountability approach with a capacity-building approach. On the one hand, teachers need to know content and they need to be held accountable for student achievement. On the other hand, they also need to collaborate in the design of environments conducive to effective learning (Wheeler et al. 1989. **BRIDGES** Research Report Series No. 5: 28).

Readings

Fuller, B. "Raising School Quality in Developing Countries: What Investments Boost Learning." World Bank Discussion Papers.

Montero-Sieburth literature review for **BRIDGES**. "Classroom Management: Instructional Strategies and the Allocation of Learning Resources."

Rugh. Effective Classroom Practices. (With Billie Jo Joy.)

World Bank. "Teacher Training and Student Achievement in Less Developed Countries." World Bank Staff Working Paper No. 310. 1978.

Teacher Training and Student Achievement in Less Developed Countries

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TEACHER TRAINING AND STUDENT ACHIEVEMENT
IN LESS DEVELOPED COUNTRIES

This paper reviews major research findings pertaining to the relationship of teacher characteristics, including the level of educational attainment and pedagogical training, with student performance in developing countries. The authors report that they found this relationship to be complex and mixed, some of the variables showing positive relationship, while others showed negative or no correlation. They conclude that a larger number of especially the more carefully designed and executed studies revealed a positive relationship between teacher training and student achievement in LDCs.

This conclusion is given further support in Section II of the paper which consists of a re-analysis of data collected in India and Chile by the International Association for the Evaluation of Educational Achievement (IEA).

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PREFACE

Teacher training is a major area for Bank financing in view of the fact that provision of qualified teachers has been and continues to be a major constraint faced by LDCs. However, in recent years educators have expressed doubt whether increased investment in teacher training will necessarily result in better education. In brief reference to this issue the 1974 Education Sector Paper stated (pages 36-7):

"The findings of recent research tend to challenge some of the assumptions concerning the relationships between .. level of training of teachers, and student achievement ... A study in a Latin American country indicates that students do almost as well when studying under normal school-trained teachers as they do when they are taught by university graduates. The cost-saving implications are significant. These results should be interpreted with care to avoid hasty generalizations ... they indicate, however, that the scope for improvement in the cost-effective use of teachers may be greater than was traditionally assumed."

In an effort to shed further light on this issue the Education Department asked Professor Torsten Husén of the Institute for the Study of International Problems in Education at the University of Stockholm to study the state of the art in measuring the relationship between teacher training and student achievement. The study was conceived basically as a survey of the existing literature and research reports to examine how strongly teacher training is linked to student achievement.

As the authors indicate, the studies included in the literature review employ a variety of research designs and methodological strategies so that the conclusions must be regarded as tentative. Further, in view of the complex and mixed relationships that the study found between teacher characteristics and student achievement, the authors urge caution not to make simplistic interpretations and conclusions.

Notwithstanding the above constraints, the study nevertheless makes an important contribution to the current discussion in the Bank and merits wide circulation within and outside the Bank. The major conclusions and policy recommendations of the study are summarized on pages 55-70. In their conclusions the authors point out that, although the interrelationship between the variables are mixed, a clear pattern can be seen: the bulk of the studies show significant positive effects, a smaller number show no effects, and few show negative effects. According to the authors, "by far the most impressive evidence focused on variables linked with teacher qualifications and credentials. Contrary to the arguments presented elsewhere, the evidence here suggests that trained teachers do make a difference". (pages 61-2)

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SUMMARY

The purpose of this report is to critically assess all available research in less developed countries (LDCs) which investigate teacher training variables and student achievement. The systematic search through bibliographic and institutional resources located 32 legitimate and valid empirical studies of student achievement which met the necessary criteria. Three types of studies are reviewed: (1) simple correlation studies using non-experimental data; (2) multivariate studies using non-experimental data; and (3) experimental studies.

This report begins by briefly describing the current discussions of teacher training effects in industrialized western societies, and the general tendency to question the importance of school and teacher variables in student outcomes. This is followed by a description of the strategy used in the assessment of these studies, in particular the classification and selection of the 16 teacher-related variables which are the central focus of this report.

The main body of the report, Section III, analyzes the findings of the studies relevant for each of the teacher variables. The results of these analyses, plus the recommendations derived from them, are presented in Section IV.

The general assessment of the 32 studies within the context of 16 teacher variables concludes that trained teachers do make a difference in student achievement in LDCs.

In particular, it seems clear that teacher qualifications, experience, amount of education, and knowledge are positively related to student achievement.

Secondly, certain attitudinal variables emerge as highly important, especially positive expectations of students, which it seems can override negative student self-images. On the other hand, there is only moderate support for the notion that teachers can improve student achievement by assigning more homework or spending more time preparing lessons.

Finally, demographic and social variables, such as sex, age, and socioeconomic status, appear to have mixed effects, but the emergent patterns suggest that males are more successful for science and mathematics teaching, and older teachers are more successful with secondary school students. There is only slight support for the notion that teachers from higher status backgrounds are more successful than those from lower status origins.

The report concludes with policy recommendations and suggestions for future research. With respect to policy, it is suggested that teacher training be upgraded in LDCs, with a focus on improving teacher knowledge and positive teacher attitudes towards students. Furthermore, some allocation of teachers needs to be made on the basis of social and demographic characteristics in order to maximize teacher success. This can be done only after the relevant demographic, social and cultural characteristics of a country have been well investigated and understood.

Further implications of this report for teacher training, especially with respect to "threshold effects", teaching styles, and alternate methods and strategies for costs and efficiency, are briefly considered.

Future research should attempt to find out how and under what circumstances teachers in LDCs are most effective. Studies using an experimental, multi-variate design should be preferred, and attention should be directed to interactions between teacher variables. Replications conducted in different types of societies, different subject areas, non-cognitive outcomes, and different grade levels are strongly advised, as it cannot be assumed that education operates in the same manner in all societies. Only then will the teacher-learning process in LDCs be better understood.

Introduction

Recent survey research, notably the Coleman (1966) study on equality of educational opportunity, in the United States, the study commissioned by the Plowden Commission in England on 11-year-olds (HMSO, 1967), and the 20-country study conducted by the International Association for the Evaluation of Educational Achievement (IEA) (Walker, 1975) has raised doubts as to whether teacher qualifications, and particularly teacher training, make any difference. Such a proposition runs counter to common sense and has inspired an extensive methodological discussion. Needless to say, attempts to identify and assess the relative importance of certain factors in the pedagogic milieu that account for student competence is extremely difficult. Factors that determine outcomes, both cognitive and affective, are almost inextricably intertwined and interact in a complicated way in bringing about learning. Nevertheless, there is an almost boundless body of research on how outcomes of schooling are related to various "input" factors.

Sophisticated techniques, of which some have been applied in the research presented in the second part of this report, have been developed to measure the direct and indirect effects of specific factors in the pedagogic milieu.

Most of these studies have been conducted in the United States and Europe. The difficulties that beset the measurement of teacher classroom behavior has led most researchers to use formal credentials, such as length of formal schooling, training certificates and length of service, as proxies of teacher competence. As can be seen from the literature review, there is a large number of American and European studies on how teacher behavior and teacher competence are related to student achievement. Since relatively few surveys in which student achievement have been used as a criterion, have been conducted in developing countries, the literature search has located only some 32 studies from some 20 developing countries, where attempts have been made to identify and measure the impact of teacher qualifications.

The present report consists of two parts. Part I presents the outcomes of the literature review in which all relevant studies have been considered both conceptually and methodologically. Dr. Lawrence J. Saha has been responsible for the literature search and has authored this part of the report. Part II presents a re-analysis of data collected in India and Chile by IEA. By applying new techniques of multivariate analysis, attempts are made to assess not only the direct and indirect effects of teacher competence, as measured by formal credentials, but also the potential effects of improved teacher education. Dr. Richard Noonan has been in charge of the research behind this part and has written it. A technical Appendix presents details about the methods employed.

Both parts of the report lead to the conclusion that teacher education makes a difference both in developed and in developing countries, particularly in the latter.

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PART I: LITERATURE REVIEW

INTRODUCTION

A. Background of the Project

The impetus for the literature research into the relationship between teacher training and student performance in less developed countries (LDCs) is found in the World Bank's Education Sector Working Paper (1974). The Bank's current policy regarding the potential resources of teacher upgrading for increased efficiency in education is based on the conviction that one of the major handicaps of educational systems in LDCs has been the shortage of good teachers at all levels, both with respect to supply and adequate training. Furthermore, attempts to upgrade teachers have generally not been successful. The problem is particularly important since, as the Bank's statement points out, "... teacher costs, which range from 75% to 95%, are by far the most important single factor determining education expenditures". (p. 36)

The Bank's sector paper also recognizes that the presumed relationship between teacher training and student achievement must be regarded with caution, since "the findings of recent research tend to challenge some of the assumptions concerning the relationships between class size, level of training of teachers, and student achievement" (p. 36). Thus the efficiency of teacher training programs to improve educational outcomes in LDCs may be problematic.

Because of the uncertainty of some current research findings, the Bank has reopened discussion about financing teacher training programs, the reason being that "it does not help". In order to provide a more firm basis for policy decisions in this area, the Bank has commissioned the Institute for International Education, University of Stockholm, to provide a position paper which will include, along with further analyses of relevant IEA and Botswana data, a thorough critical survey "on the current knowledge about the correlation between teacher training, the instruction given by teachers and the students' learning".

This literature review, will then critically examine all legitimate research, experimental as well as survey, which investigate all aspects of teacher characteristics and behavior and student achievement in less developed countries. Relevant studies from developed countries will be discussed where appropriate.

B. The Literature Review: Proposed Outline

The literature report, as indicated in the table of contents, is organized into four parts. The first part will briefly summarize the current state of knowledge about teacher effects in developed societies. The problematic nature of this research will be discussed and the implications for developing countries will be made clear in order to show that findings in developed countries may not be the same as in the less developed ones.

Part II consists of a description of the procedures which will be followed in the assessment of the research literature. In particular, the sixteen teacher variables which have been isolated in the literature are described.

The main section of this report, and the lengthiest, is Part III. The findings of the 32 studies are described and discussed within the context of each teacher variable. The intention here is that by consulting the discussion of a teacher variable, e.g. teacher experience, one can find the evidence from the relevant studies critically discussed and assessed.

Part IV will include a summary of the findings as they relate to teacher training upgrading programs. Policy implications from these general conclusions are then presented.

Systematic summary tables of the studies considered in Part III will be found in the annexes. Furthermore, some conceptual and methodological issues which may bring about an underestimation of teacher effects in LDCs will be briefly reviewed. Attention is directed to some generally held assumptions about the educational context of children in LDCs, specifically the impact of schooling on cognitive development, the cross-cultural sharing on cognitive processes, and the actual experience of schooling itself. The methodological summary will include a discussion of the limitations of survey research for assessing teacher effects, and the assumptions underlying multiple regression and variance explained strategies.

An appendix describing the search strategy for the relevant achievement studies and a complete bibliography conclude the report.

I. TEACHER TRAINING AND ACHIEVEMENT IN EDUCATIONAL RESEARCH

A. Developed Countries

The current debate about the determinants of student achievement, and specifically the contributing effect of teacher variables, has its origins primarily in the findings of the Coleman Report (1966), and later, the work of Jencks et al., (1972). Both of these studies concluded that school service effects were minimal in the explanation of student achievement. On the one hand, the EEOS study did isolate one teacher variable of some significance, i.e. verbal ability (possibly a proxy for a number of related skills and qualities). However, Jencks and his colleagues were less optimistic, as is apparent in their frequently-cited conclusion:

"Our research suggests, however, that the characteristics of a school's output depends largely on a single input, namely the characteristics of the entering children. Everything else - the school budget, its policies, the characteristics of the teachers - is either secondary or completely irrelevant." (p. 256)

These two studies have tended to dominate current educational thinking (at least in the United States) and have cast doubt in the minds of many policy-makers about the usefulness of increased investment in the educational establishment, both in developed and less developed countries. However the findings of Coleman and Jencks have not been entirely consistent with the cumulative body of research in this area.

To date there have been numerous attempts to systematically review the achievement literature in order to critically assess, synthesize, and organize the information currently available, but with mixed success. The results of four of these reviews are briefly summarized here.

1. Lavin's (1965) The Prediction of Academic Performance, sponsored by the Russell Sage Foundation, preceded the Coleman Report by one year. This survey covered almost 300 studies published between 1953 and 1961, and was divided into six topical areas: (1) the concept of academic performance and problems of measurement, (2) the problem of predicting academic performance, (3) intelligence factors as predictors, (4) personality factors as predictors, (5) sociological determinants of performance, and (6) directions for future research.

The investigation of studies which included teacher variables were restricted to those dealing with the congruence of student and teacher role expectations and the relationship between teacher behavior and achievement. After reviewing thirteen studies on role expectations, Lavin concluded that "the degree of congruence in student-teacher values, attitudes and expectations is directly related to the academic performance of the student". Of the four studies of teacher behavior effects he was more cautious and concluded that "student behavior is more independent of the acts of the teacher on the high school level than on the elementary level" (p. 144).

2. The Coleman Report was directly responsible for a second review of the literature which focused specifically on the effects of school and teacher variables on achievement. Guthrie's (1970) "A Survey of School Effectiveness Studies" (in Do Teachers Make a Difference?) examined 19 studies conducted between 1956 and 1969. Without taking into account the relative importance of teacher effects, Guthrie concluded that the evidence unambiguously and consistently supported the existence of significant relationships between some teacher variables and student achievement. In summary, his findings were as follows:

- (i) Fifteen studies reported significant positive relationships between student performance and teacher verbal ability, amount and type of academic preparation, degree level, job satisfaction, and employment status.
- (ii) In those studies which included them, access variables were found to have a consistently positive effect on achievement, namely: student-staff ratios, classroom size, school or school district size, and length of school year.
- (iii) Building and other resources were also found to have positive effects on achievement, such as age of building, extent of physical facilities, expenditures per pupil, and the teacher salary levels.

3. A more extensive literature review was that commissioned by the IEA to provide a background for future IEA reports. In Teaching Behaviors and Student Achievement, Rosenshine (1971) analyzed "approximately 51" studies covering seven aspects of teacher behavior and a number of antecedent and demographic teacher characteristics. 1/

Understandably the results of this detailed and far-ranging investigation are difficult to synthesize, and only the most important conclusions need be mentioned here. Briefly, Rosenshine found that in about half the studies, certain aspects of teacher approval behavior were consistently and significantly related to achievement, namely teacher use of criticism, use of student ideas, and teacher warmth. Studies of teacher cognitive behavior produced mixed results, although there was consistent support for the importance of achievement-oriented behavior, organization, clarity, and structuring. There were no consistent relationships with the variables difficulty of instruction and use of questions in the classroom.

There were consistent positive relationships for teacher enthusiasm and frequency of teacher-student interaction, as well as general student and teacher ratings of teacher behavior. The only "time-related" variable which emerged as consistently significant was student opportunity to learn, used in the IEA mathematics study.

1/ Most of these studies were conducted and reported in the United States while only a few were from England or Australia.

It should be noted that these variables deal with aspects of teacher behavior, and the literature is not consistent as to whether these behaviors can be "taught" or are irrevocably determined by background factors (Morrison and McIntyre, 1969). Nevertheless one can hypothesize that given the necessary knowledge about the determinants of teacher behavior, any desired behavior can be instilled through appropriate teacher training programs. However, regarding the antecedent and demographic variables, which in many respects include the more traditional teacher characteristics, and those perhaps more immediately relevant to policy manipulation, Rosenshine reached the following conclusion:

"Consistent and significant results were not found in the areas of teacher experience, amount of teacher training, teacher knowledge, and teacher general attitude." (p. 219)

4. Without doubt, the most comprehensive recent attempt to critically assess and synthesize research on student achievement has been that by Averch et al. (1972), How Effective is Schooling? prepared by the Rand Corporation for the President's Commission on School Finance. The reviewers selected approximately 100 important and methodologically valid studies for analysis in order to "assess the current state of knowledge regarding the determinants of educational effectiveness". They subjected these studies to rigorous examination regarding internal validity and inter-study consistency. A broad range of studies within five "approaches" were included: (1) the input-output approach, (2) the process approach, (3) the organizational approach, (4) the evaluation of broad educational interventions, and (5) the experiential approach (the so-called "reform" literature).

The overall conclusions of this review are summarized in five propositions: 2/

1. "Research has not identified a variant of the existing system that is consistently related to students' educational outcomes;
2. Research suggests that the larger the school system, the less likely it is to display innovation, responsiveness and adaptation and the more likely it is to depend upon exogenous shocks to the system;
3. Research tentatively suggests that improvements in student outcomes, cognitive and non-cognitive, may require sweeping changes in the organization, structure, and conduct of educational experience;

2/ Averch et al. actually reach six conclusions, one of which is not included here since it does not relate directly to the subject of this report. The underlined passages above are mine.

4. Increasing expenditures on traditional educational practices is not likely to improve educational outcomes substantially;
5. There seem to be opportunities for significant redirections and in some cases reductions in educational expenditures without deterioration in educational outcomes". (pp. 154-158)

The generally ambiguous and null conclusions of these four surveys of the achievement literature continue to receive support in much of current empirical research in developed countries. The findings of Jencks and Brown (1975) in their reanalysis of achievement outcomes for 98 Project Talent schools is a recent example. Using nine measures of achievement outcomes and eight school characteristics (all aggregated at the school level), Jencks and Brown conclude that "... high school characteristics such as social composition, per pupil expenditure, teacher training, teacher experience, and class size have no consistent impact on cognitive growth between the ninth and twelfth grades". (p. 320)

What do these various reviews of the research literature tell us about the importance of teacher characteristics on student achievement in developed countries? On the one hand, taken at face value, the weight of cumulative evidence casts serious doubt that teachers, given their present level of training, explain much of the difference in student performance. There are others, however, who argue that the results of these studies are problematic on methodological or other grounds, and that the real importance of teacher effects have yet to be adequately investigated. Nevertheless, in terms of policy relevance for further improving the efficiency of educational systems, there is a growing consensus of scepticism which is best reflected in the following summary observation of education production studies:

"Research to date has found little or nothing in school resources that consistently and unambiguously makes a difference to student outcomes, such as achievement. Once widely-held beliefs about the overriding importance of school and teacher quality have been called into question, if not refuted". (Nollen, 1975:74)

B. Less Developed Countries

It would be presumptuous to uncritically extrapolate the findings from developed countries to the developing ones. However, to date there has been relatively little research on the determinants of achievement in LDCs. Thus, in order to have some guidelines for policy decisions, the Bank commissioned its own survey of available literature, which is probably the only one thus far attempted. In The Determinants of School Achievement: The Education Production Function, Alexander and Simmons (1975) located 17 EPF studies, nine of which provided the basis for their assessment. Using a stringent criterion for accepting studies for their review (OLS multiple regression), the authors directed attention specifically to those factors which could be manipulated by policy decisions.

Drawing on data collected from nine developing countries (St. Lucia, Kenya, Tunisia, Chile, Puerto Rico, Malaysia, Iran, India, and Thailand), Alexander and Simmons conclude that the determinants of achievement in LDCs do not differ markedly from those found in developed countries. Their findings concerning the relative importance of home background or parental socio-economic status are mixed. They find that student background effects are consistently strong at the primary and early secondary levels, but become less important in upper secondary grades.

They argue that there seems to be general consistency among the findings that home background or parental socio-economic status exercises a strong effect on student performance at primary and lower secondary grades in all academic subjects tested, though the variance explained appears to be somewhat less than comparable findings in the developed countries.

Although there can be little question that schools in LDCs promote learning, and that inefficient schools might be preferable to no schools (see the discussion in the next section of this report), Alexander and Simmons appear doubtful about the possibility of improving learning rates by educational policy changes "along traditional lines, such as providing more and/or better teachers and facilities" (p. 52). Their conclusions regarding the importance of teacher variables are particularly relevant here, given the scope of the present report.

1. "Teacher certification and academic qualifications are not important at primary and lower secondary grades. However they appear to be important at upper secondary grades..."
2. "The percentage of teachers on permanent contract (tenure) is not important at primary and lower secondary grades."
3. "Teacher experience does have a positive influence on performance in primary and lower secondary grades. However, it is not important in the upper secondary grades."
4. "Teacher sex has a changing impact on performance. Male teachers positively influence male students grades 5 to 8, but have a negative influence on male and female students at the upper secondary level."

The authors further conclude that while expenditure variables are not important predictors of student achievement, teacher motivation, textbook availability, and the amount of homework performed by students do emerge as significant. Thus the policy recommendations regarding teacher training are limited to improved screening in teacher recruitment and training teachers how to assign homework (Alexander and Simmons, 1975:55).

Thus, even from this preliminary perspective, it appears that the support for the importance of teacher variables as determinants of student achievement in LDCs is far from impressive. Clearly, a focused assessment of all relevant and valid empirical studies needs to be carried out before any reliable policy inferences for teacher training can be drawn. Furthermore, it should be kept in mind that school achievement research in LDCs is based upon a number of assumptions and follows methodological procedures which may underestimate the true importance of teacher effects. A discussion of some of these contextual and methodological issues as related to LDCs is found in Appendix A.

Attention is now directed to the strategies used for selecting and classifying the studies relevant for this report, and the specific variables related to the analysis of teacher effects.

II. TEACHER CHARACTERISTICS AND ACHIEVEMENT IN DEVELOPING COUNTRIES:
DESCRIPTION OF CLASSIFICATION PROCEDURES

At the time of writing this report, 32 separately authored studies relating teacher variables and student achievement in LDCs had been located and analyzed. 3/ However, as will become clear, many of these studies actually consist of a number of replications, for example separate analyses of both primary and secondary students, in different countries such as Chile and India, and using different performance measures, such as science and reading. Thus the IEA report on science achievement by Comber and Keeves (1973) includes studies of three school population groups (10-years-old, 14-years-old, and final year of secondary schooling) in four developing countries (Chile, India, Iran, and Thailand) 4/. If these replications are considered as separate studies (which they are), each contributing to the cumulation of knowledge about teachers and student performance, the total number of independent studies represented in this report is 64. Studies which investigated student achievement but without specific measures of teacher related variables are not included in this report. 5/

A. General Classification of Studies

In order to facilitate later discussion of these studies, it is first useful to describe them in a general systematic manner. With respect to inclusion criteria, the primary requirement for a study to be considered in this review was that it includes a measure, either direct or by proxy, of teacher related variables. Thus if an author used "school quality" as an analytical variable, but took this as an indicator of "teacher quality" (as in Silvey, 1972) the study was included. On the other hand if a reference to any teacher characteristic was not explicitly made (as in Studstill, 1976), the study was not included.

3/ No assumption is made that all existing studies have been located. However, given the search strategy (of Appendix B) it is unlikely that any major study relevant to this topic remains unknown.

4/ For this and other IEA reports, each country was not necessarily studied for each population or each performance criterion. Thus for science achievement, there was no study of Pop. I (10 yr) students in Thailand.

5/ Of particular importance are a number of studies which investigated the effects of background variables, without including school or teacher variables. Indirectly these studies are useful in that they lend indirect positive support or negative support for the findings in developed countries. Such studies are Chopra, 1967; Epstein, 1974; Hornik, et al., 1973; Leacock, 1972; Lynch, 1975; Weightman and Rihani, 1967; Currie, 1974; Drysdale, 1972; Garcia, et al., 1974; Simmons 1970/1972; 1970; Studstill, 1976; Ayabe, 1973.

As can be seen from Annex Table I, the studies can be classified according to two dimensions. The first differentiates between those which utilize multivariate techniques that is, one or more control variables in the analysis of the relationship between the independent and dependent variables, and bivariate techniques, which consider only the direct relationship between two variables. The second dimension differentiates between studies based on survey research designs and experimental research designs.

As apparent in Annex Table I, there is considerable imbalance in the frequency with which studies of these various types have been conducted. By far the most common type of study relating teacher characteristics and student performance in LDCs has been the survey, using multivariate analytic strategies, with 20 studies falling into this cell. This is followed by seven studies which are survey researches using bivariate techniques, three of which incorporate an experimental design and multivariate strategies, and finally two which are experimental and bivariate.

From a methodological point of view, the most important studies should be those which follow experimental multivariate strategies since the effects of particular teacher characteristics on student performance are identifiable and measurable in a reliable and valid manner. The next most valuable set of studies are the survey multivariate-type, although they suffer the weakness of the cross-sectional design. Of less value in contributing to our knowledge of teacher effects are the bivariate studies, since they do not take into account multi-collinearity as discussed in Appendix A. It should be noted, however, that other things being equal, the experimental studies are more useful than the survey studies.

The above comments are essential in assessing the respective merits of the various studies reviewed in this report, as more weight will be given to those studies which are most sophisticated and reliable. Furthermore the unequal frequency of studies of the various types, and in particular the low number of potentially the most valuable type of study may highlight the need for the planning and design of future studies of social factors of differential student achievement in LDCs.

Annex Table II shows the various countries covered by the studies in this report. Overall, 19 LDCs are represented, seven in Africa, five from Latin America, and seven from the Middle East and South East Asia. The only area completely unrepresented is the South Pacific, including Papua-New Guinea.

B. Description of Teacher Variables

As is always the case in attempts to synthesize large numbers of researchers according to some criteria, judgment is always called for in the identification and classification process according to which the criteria have been met. This was certainly the case in preparing this report. While on the surface, the mandate to survey the literature on teacher effects in LDCs may seem clear and unambiguous, this was not the case. Teacher variables are many, and variations in conceptualization and measurement in these studies required

decisions as to the important groupings and classification dimensions represented. In the end, after a careful reading of previous literature reviews of teacher variables, and the 32 LDCs studies, four groupings of teacher variables were constructed, each with a more specific subset of relevant teacher characteristics. Fifteen teacher variables, plus the combination of school-teacher variables into a block, unique to the IEA studies, were further identified. All of these variables are policy-relevant and can be manipulated through teacher recruitment and training programs. In this report, the teacher variables can be described as follows:

1. Demographic and Background Variables

The variables in this group pertain to factors which are probably best controlled through recruitment and selection to the teaching profession. They are in the order found in Annex Table III as follows: sex, age, socio-economic background, and the extent to which English was spoken in the home.

2. Teacher Qualifications and Training

This group of variables pertain specifically to aspects of teacher certification or levels of competence as determined by "officially recognized" credentials. Included here are teacher educational attainment (number of years schooling or level attained), educational qualifications (teacher diploma, certificate, etc.), cognitive ability, teaching experience, salary, and finally participation in teacher upgrading programs.

3. Teacher Behavior and Attitudes

The variables identified within this group are attitudes towards students (expectations of students), teaching methods (technology, TV, radio, programmed teaching, etc.), teacher absenteeism and punctuality, attitudes toward job and career, and finally teacher behavior (homework assignments and amount of lesson preparation).

4. School-Teacher Block Variables

This section includes IEA studies where the regression analysis strategy first grouped variables into homogenous "Blocks" corresponding to the major factors presumed to affect student achievement. Each block was then entered into the equation, with step-wise procedures determining the order to entry of individual variables within blocks. Thus, for example, in Comber and Keeves (1973), Block 1 consisted of student home background variables and entered the equation first, while school type was included in Block 2 and entered the equation second. For most IEA volumes, school condition variables and teacher variables were incorporated into Block 3, and entered the equation after Block 2. Although the individual teacher variables which were included in Block 3 varied within IEA from study

to study, the value of these data lie in the relative importance of school-teacher variables for achievement vis-a-vis other Blocks, and for different LDCs, student populations, and achievement subjects. Annex Table III shows the variables which were considered in each of the thirty-two studies discussed in this report. The table will serve as an overview and guide to the following discussion of research evidence for the importance (or lack of it) for each teacher variable.

III. TEACHER CHARACTERISTICS AND STUDENT ACHIEVEMENT IN LESS DEVELOPED COUNTRIES: ANALYSIS OF THE RESEARCH

A. Demographic and Background Factors

It is not difficult to develop an argument showing the importance of background variables of teachers with respect to student achievement. For example, one could argue that females are more effective in the primary grades and males in secondary grades. Likewise one might hypothesize that older teachers are more or less successful depending on whether the relevant characteristics are experience and stability on the one hand or enthusiasm and close identity with students on the other.

There is sound reason to suspect that demographic characteristics such as these might be important in LDCs. For example, in societies where age and sex roles are clearly defined, the relationships between students and teacher could be seriously affected.

The same holds true for the SES background of the teacher. R. Dave for example, has argued, that at least in India, good teachers are partly the result of family background - that teaching "runs in the family", and for whatever reason - an environment of curiosity, or a family tradition of teaching - people from these backgrounds turn out to be more effective teachers. 6/

In each of these examples there are policy implications with respect to intervention programs designed to maximize the teaching process in LDCs.

Turning to the studies included in this report, four teacher variables have received attention: sex, age, SES background, and frequency of spoken English in the teacher's childhood home.

The first observation which can be made about this set of variables is how little attention they have received in research on student achievement in LDCs. For example only a third of the studies in this report have taken teacher demographic and background characteristics into account. On the one hand, as already suggested, the effects of teacher sex, age, and in particular socio-economic origin, may be crucial in understanding the mode (quality) of interaction between teacher and student in the classroom context. On the other hand, one could argue that demographic and background variables are so highly intercorrelated with more specific teacher competence characteristics, which are more readily interpretable and manipulatable, that they are less important in empirical research.

6/ By personal communication, IIEP, Paris, March 18, 1977.

1. Sex of Teacher

It was pointed out earlier by Getzels and Jackson (1963), that some personal-social characteristics were different for men and women teachers at both primary and secondary levels, with men being generally more business-like and emotionally stable but less friendly and responsible. Morrison and McIntyre (1969) have further noted that the sex of teachers has a "pervasive" influence on "perceptions of pupils, the aspirations and attitudes of pupils, and the teacher's degree of involvement in the job of teaching". (p. 51)

In the IEA twelve-country study of mathematics achievement, while there were clear differences between countries, the overall pattern of zero-order correlations for each of the four student populations indicates that male teachers are slightly more successful than females (Husén, 1967:270-271). With respect to LDCs, Alexander and Simmons (1975) concluded from their review that male teachers were more effective for the performance of male students for grades 5 to 8, but less effective in general at later secondary levels.

The evidence from IEA clearly documents wide disparities between countries, grade levels, and subject areas in the proportions of males and females in the teaching corps. The data presented in Comber and Keeves (1973), for example, show that for 10-years-olds (Population I) the proportion of male science teachers for fifteen countries varied from a low of 8% (Hungary) to a high of 91% (India). For 14-year-olds (Population II) the range for seventeen countries was 17% (Iran) to again 91% (India), with a similar pattern for terminal second-year students. Since these variations cut across the LDCs in the sample, it is highly likely that cultural differences regarding sex roles and the teaching profession are present, and should be kept in mind when interpreting research results.

As indicated in Annex Table III, seven of the 32 studies included information and analyses of teacher sex and its effects on student performance. However, taking into consideration separate analyses by country, school level, and subject area (i.e. the achievement criterion), there are, in fact, 26 studies reported by the seven sets of authors (see Annex Table IV.1).

Each of these studies has been carefully examined to record (and in some cases determine) the direction and strength of the association between sex of teacher and achievement. For all studies, a positive relationship (+) indicates that female teachers are associated with higher student performance, whereas a negative relationship (-) indicates the opposite. For the Carnoy, Klees and Ryan studies, the researchers own assessments regarding the significance of the relationships were accepted. For the IEA zero-order relationships, t-tests were performed to test statistical significance taking into account the variations in sample size (see Peaker, 1975, for a full account of sampling for schools and students). 7/

7/ This same procedure holds for all zero-order coefficients reported from the IEA studies.

As indicated in Annex Table V, nine of the relationships were positive, favoring female teachers, twelve were negative, favoring male teachers, while six recorded no relationship at all. Thus the overall evidence seems to slightly support the notion that male teachers are more effective than female teachers. However this very general observation requires considerable caution, as the specific patterns are more complex.

Carnoy (1971), for example, found in his analysis of 1967 school data in Puerto Rico for grades 3, 6, 9 and 12 that the proportion of male teachers in a school was slightly related to higher Spanish and general ability examination performance in the third grade, but negatively (and more strongly) related for grades 6, 9 and 12.

Ryan (1974), on the other hand, studied 797 second grade students in three governorships in Iran and found that the female teachers were significantly more successful than the male ($r = .28$). However, stratifying by sex, Ryan found that female teachers were effective mainly in larger and urban schools, and moreover, because of multicollinearity with other background, school and teacher variables, teacher sex was not included in the multiple regression equations.

Finally, Klees (1972) investigated the effects of television and other determinants on mathematics and language achievement in Mexican secondary schools. Sampling two groups of schools in four areas, those using Telesecundaria instructional TV and traditional instruction ($N = 58$ classes, 1,236 students and 23 classes and 1,101 students (respectively)). Klees found that while there were no differences in language results, male teachers were more effective with respect to student mathematics achievement.

Given these variations in teacher sex effects suggested by the foregoing three studies (i.e. grade level, region, and subject area), what do the IEA results indicate? The pattern of coefficients is hardly consistent, as an inspection of Annex Table IV clearly indicates. In general there is more support for greater success among male than female teachers, particularly in pupil science achievement. This is clearly the case for Chile, though less clear for India and Iran. On the other hand, four of the six analyses of performance in English and French as a foreign language show female teachers to be more successful, and in three of four analyses in these subjects from the Chile samples.

Thus it would appear from the IEA data at least, that males are more successful than females in science teaching, while females are more successful in languages, and perhaps related subjects. There do not seem to be any consistent patterns for the various school level populations or the countries of India, Iran and Thailand.

As mentioned earlier, the intercorrelation between sex and other relevant teacher and personality variables requires more rigorous multivariate analysis before firm conclusions about the effectiveness of male or female teachers can be drawn; unfortunately the evidence available from these studies does not permit high level analyses. Nevertheless it would be premature to dismiss sex as an important teacher characteristic in maximizing student achievement in LDCs, and moreover the emergent patterns from these data suggest the possible effectiveness of selective recruitment by sex, and more emphasis could be given to matching male and female teachers with students, regions, student age groups, and subject areas, at least in those countries where cultural norms would permit.

2. Age of Teacher

Teacher age correlates with many relevant teacher characteristics, for example experience, seniority, salary and career stability and commitment. Getzels and Jackson (1963) point out that older teachers tend to manifest classroom behaviors distinct from younger teachers, in that the former are less systematic and businesslike and more "permissive". Finally, insofar as cultures differ with respect to age-specific roles and statuses, teacher age is likely to have an independent effect on pupil learning and performance, though perhaps more in some societies than others.

Comber and Keeves (1973) document differences between countries in age distributions of the science teaching staff. For 10-year-old pupils (Population I) the mean age across fifteen countries ranged from a low of 26.3 years for Thailand to a high of 43 years for Italy. Likewise the proportion of teachers under 27 years ranged from 61% for Thailand to 6% for Italy. Similar ranges, though on a slightly older threshold, prevailed for the 14-year-old and terminal year secondary school students. Insofar as these range variations cut across the four LDCs in the IEA sample, one would expect age to exercise some influence on student performance.

Unfortunately teacher age effects were not reported in the IEA reports, although there were four other studies which did include teacher age in their analyses.

Klees (1974) failed to find any relationship between age of teacher and achievement in his Mexican Telesecundaria study. This finding is consistent with that reported by Fuller and Chantavanich (1976) in their national study of 987 teachers and 23,555 third grade pupils in Thailand. The zero-order correlations of teacher age with the combined achievement score on arithmetic and Thai language at the beginning and end of third grade were $-.038$ and $-.036$ respectively. As a result of these low correlations, teacher age was dropped in subsequent analyses of the determinants of achievement. 8/

8/ It should be noted that for this Thailand study, step-wise regression procedures resulted in about equal proportions of variance being attributable to student SES, and school and teacher effects.

On the other hand, Farrell and Schiefelbein (1975) found in Chile that teacher age did have an effect on student performance. The authors studied a national sample of 8th grade classes stratified by location with a final N = 3530. Achievement was measured by scores on a national 8th grade test, which consisted of 100 questions, half verbal and half mathematics. The Beta coefficient between achievement and teacher age was .067, and was significant at the .01 level. The authors conclude that age is a proxy for experience, and is important as a determinant of student performance.

Husen (1977) also found significant age effects on mathematics and reading achievement for Standard 7 pupils in Botswana. Like Farrell and Schiefelbein, Husen notes the interrelationship between age and experience, and attributes the effects of the former to the latter. He further raises the question as to whether experienced teachers are assigned to the better schools, both in terms of students and resources, certainly a potential focus for further analysis.

How can we explain the difference between the results of the Farrell and Schiefelbein, and Husen studies, and that of the Fuller and Chantavanich study? All appear to be statistically sound and valid, and well designed and executed. One possible explanation (excluding measurement and distribution differences) might be that the Thailand sample consisted of 3rd grade students while the Chile and Botswana samples were 7th and 8th graders. It could be that age effects become more pronounced in the higher grades when perhaps experience and stability become more important. Unfortunately the only secondary level study is that reported by Klees, which lends little insight to effects of age on secondary schooling, since it concerns teachers of Telesecundaria schools in Mexico and in a strict sense is not comparable.

Whatever the ultimate explanation for effects of teacher age on student performance, it appears fairly certain from the evidence cited here, that at least toward the end of primary and in secondary school, older teachers are more successful than younger ones.

3. Teacher SES Background

Like the previous variable, teacher socioeconomic background also seems to have been little researched in LDC countries. Yet it is useful to note that in developed countries one of the major criticisms directed at schools by the reformers is the middle-class orientations of teachers and their inability to communicate with, or understand children from other status backgrounds. It would appear that at least potentially, this problem could be even more pronounced in some LDCs where the cultural differences between teachers and students might be even more pronounced.

Only three of the 32 studies investigated the status background of teachers: Farrell and Schiefelbein's (1974) study of approximately 3530 grade 8 Chilean students, Ryana's (1974) study of 797 2nd grade Iran pupils and Heyneman's study of 2293 7th grade students in Uganda (1976). In the Farrell and Schiefelbein study a small but significant relationship was found between teacher SES background and language and mathematics achievement (Standardized Regression coefficient, Beta, was .0386, $p < .01$). ^{9/}

Ryan found that "quality of secondary school" attended by the teacher was related to pupil achievement for the total sample ($r = .19$, $p = .167$), and for two of the three area subsamples. However, in one of these latter, the rural district Karaj, where 85% of the teachers are female, the relationship is negative ($r = -.15$). Ryan concludes that "quality of secondary school" is a proxy for socioeconomic background and is normally positively related to student achievement, except for the "big city girls from relatively better off families [who] do not flourish in rural environments" (p. 97)

Heyneman, on the other hand, using level of parental education only, found the zero-order coefficient to be $-.135$ and not significant. All studies used aggregate data for teachers, though Farrell and Schiefelbein and Ryan used individual student scores while Heyneman used mean achievement scores for schools.

One possible explanation for the discrepancy between the Chile and Iran data and the Uganda study might be found in differences in the class structures of the countries, and the socioeconomic composition of the teaching staffs. In a recent paper, Heyneman (n.d.) suggests that the SES of students appears to have little consistent effect on achievement in LDCs, and that the explanation might lie in the underdeveloped class structure of some LDCs where upward mobility and SES differences are found only among the first generation of students. Could this not also be the case with teachers in some LDCs, and in particular Uganda? Thus in societies where class differences are more developed, such as Chile and Iran, teacher SES background could affect the relationship between teacher and student while in "newer" LDCs, where traditional culture is more homogenous, SES remains a relatively weak and unstable social factor.

Thus propositions concerning the link between teacher SES and effectiveness must be made with caution, and only with reference to specific societal contexts.

^{9/} Teacher SES was operationalized as a compound produced through factor analysis. The variables included were: education of teacher's father and mother, father's occupational prestige, and teacher's level of formal education.

4. Frequency of English in Childhood Home of Teacher

In order to further tap the significance of both verbal ability, and perhaps SES, Heyneman (1976) measured the frequency with which English was spoken in the childhood home of teachers. He found no relationship, however, with a resulting zero-order correlation of $-.198$. As this variable is probably linked with SES of teacher, the explanation follows that given above.

B. Teacher Qualifications

This dimension focuses directly at the main purpose of this report, namely to identify and assess the importance of teacher variables related to training which have an effect on student outcomes. An examination of the 32 studies covered here have produced five variables which have been placed in this classification: years of education, type of teacher qualification, level of cognitive ability, teacher experience (or seniority), and participation in upgrading or refresher programs. Clearly if strong relationships between student achievement and these qualifications variables are consistent, the policy implications for raising school outcome is readily apparent. It should be noted, however, that a major controversial issue concerns the fact that these variables have not shown consistent relationships with achievement outcomes in LDC studies (Alexander and Simmons, 1975).

5. Teacher Educational Attainment

It is generally assumed that educational attainment produces the cognitive competencies and skills necessary for effective training. Indeed the amount of education is often crucial in industrialized societies for certification requirements, the accreditation of schools, salary promotions, and in teaching-training programs (Charters, 1963). At the same time, however, it has been suggested that, at least for some kinds of teaching (i.e. early primary, only modest levels of educational attainment by teachers is really necessary). 10/

If exposure to schooling by prospective teachers has any cumulative effect on ability, and by implication on teaching success, one would expect that teachers with more schooling would be more successful, in terms of student achievement, than the less schooled. However, the evidence from LDCs is not at all clear and, in fact, suggest the absence of such a relationship. Of the eleven separate studies which include teacher educational attainment in the analyses, only four report significant positive associations (see Annex Table IV.5). This lack of evidence is even more impressive when one considers the diversity and quality of the studies which have examined this variable.

10/ Personal communication from Gabriel Carron, IIEP Paris, March 18, 1977. Carron was referring specifically to literacy and early primary teaching by relatively "uneducated" teachers in Cuba, and untrained teachers in the German Democratic Republic.

The four studies showing direct lines between teacher years of schooling and student performance are Carnoy (1971) for primary grades only, Husén (1977) for primary grade mathematics achievement, and Purves (1973) for Chile and Iran Population II (14-year-old) achievement in literature.

Carnoy analyzed the 1967 School Survey Data from one-third of the schools in Puerto Rico for grades 3, 6, 9 and 12, using Spanish Reading and General Ability examination results as criteria variables. The teacher data were taken from school records, and all data were aggregated at the school level. Measured as "years of schooling", Carnoy found that teacher educational attainment was positively and significantly related to performance for both achievement criteria for grades 3 and but not grades 9 and 12. Furthermore, the effect of teacher schooling level was stronger for low SES pupils at the primary level.

Husén's study of 869 Standard 7 pupils in Botswana found that the years of basic education of teachers was positively and significantly related to achievement in mathematics but not in reading comprehension. This distinction seems to support the notion that skills such as science and mathematics may be more related to teacher ability than reading, which in turn may be more related to background factors. 11/

Purves found that teacher education was significantly related to literature achievement (not the same as reading comprehension) for the 14-year-old (Pop. II) students for the IEA data from Chile and Thailand; it is interesting that no such relationship was found for older students in the final year of high school, which is somewhat consistent with Carnoy's findings, noted above.

Against these four positive findings, there were seven where no relationship between teacher schooling and student performance was found. Most notable here are the studies by Izquierdo and Guzman (1971), Fuller and Chantavanich (1976), and Heyneman (1976a,b).

Izquierdo and Guzman studied 519 primary school students in Mexico with respect to mathematics and language achievement, and report the zero-order correlation between achievement and schooling of teachers to be $-.069$ and not significant. Likewise, in their National study of 27,897 grade 3 pupils in Thailand, Fuller and Chantavanich found only $.11$ and $.12$ zero-order coefficients for beginning and end of year achievement in mathematics and Thai. In this regard, Heyneman's finding from his school-level analysis of Uganda grade 7 pupils in 67 schools is perfectly consistent, as the zero-order relationship between mean teacher years of schooling and mean school achievement

11/ Husén's data do seem to support this contention, as home background variables of students (especially parents' education and reading and writing ability) appear more strongly related to reading comprehension than mathematics achievement (see Table 36).

was -.11. Finally, Levy (1971) also failed to find a relationship between years of schooling and dropout rates in her analysis of 42 LDCs, with data aggregated at the country level.

What, then can be concluded from these mixed results on the effects of teacher educational attainment? First of all, it must be noted that all of the studies cited, except Levy's, used teacher data aggregated at the school level. This clearly has the effect of minimizing individual teacher effects on educational students. Furthermore, if the allocation of teacher to schools is such that there is an equal distribution of teacher quality between schools, then the levels of analysis and statistical procedures could not possibly locate relationships, as there would be little teacher variance with which to explain achievement variance. Heyneman's (1976b) exploration of this possibility with respect to his Uganda data is particularly relevant and useful on this point. Thus the mixed relationships may, in fact, result from differences between countries in the distributions of teachers of varying quality between schools.

Thus the Carnoy, Husén, and Purves studies are important, since they deal with several samples within the same country, differentiating between grade level and/or achievement criteria, and all found at least one positive relationship. If one assumes that the distribution of teacher quality in these countries is uniform, then the mixed findings which each reports are informative. One might tentatively hypothesize on the basis of these results that teacher schooling is more important for achievement in the earlier rather than later school grades, and for those subject areas (such as mathematics, science, and literature) which are more dependent on school factors as distinct from home background factors.

6. Teacher Credentials and Certification (Level of Training)

Although there has been considerable debate in North America and the UK about the impact of teacher training on teacher success (Morrison and McIntyre, 1969), results from the IEA study of mathematics achievement in 12 developed countries appear to leave little room for doubt. For all student populations, and in virtually all countries, the relationship between "length of teacher training" and mathematics achievement was positive (29 out of 34 correlations; Husén, 1967:270-271). However in their survey of LDC studies, Alexander and Simmons (1975) found little evidence of teacher training effects, at least for early grades, and concluded that "teacher certification and academic qualification are not important at primary and lower secondary grades" (p. 54).

Teacher qualification variables were the most numerous of the teacher variables among the 32 studies of this report, as one-half (16) of the authors incorporated some form of training measure. Counting the IEA samples as separate studies, there are thus 24 results to assess.

Unlike the previous teacher variable, i.e. teacher level of schooling, the pattern of relationships here are somewhat more consistent. There were 17 positive relationships, 9 null relationships, and two negative relationships among the findings (see Annex Table V.6).

The case for the direct importance of training for teacher success is reasonably strong. On the one hand, the studies by Fuller and Chantavanich (1976), Husén (1977), Youdi (1972), Comber and Keeves (1973) and Beebout (1972), are consistent in their conclusions that students perform better with more highly trained teachers. Fuller and Chantavanich's already-mentioned national study of Thai 3rd grade pupils included a measure of the "degrees the primary school teacher received especially in professional training programs" (p. 11). The zero-order correlation for this variable with mathematics and Thai tests at the beginning and end of grade 3 were .159 and .093. The Beta coefficient for the regression of the independent variables on end-of-year achievement was .072, but this only increased the amount of variance explained in the model from .322 to .327.

Like the findings for teacher schooling, Husén found that teacher training was related to one achievement subject but not the other; in this case, trained teachers were more successful for reading achievement than mathematics ($F = 4.65$, $p < .05$ and NS respectively). However it should be noted that rank-order correlations between schools resulted in significant relationships for both reading and mathematics ($S = .48$, $p < .001$ and $.42$, $p < .01$ respectively). Husén explains the apparent discrepancy by observing that "untrained teachers [in mathematics] at this level are exceptions who most likely have proved to be skillful in order to be assigned to Standard 7 classes" (p. 35).

Of the science achievement results, Comber and Keeves found that at the Pop. IV level (final year of high school), four of the six correlations for Chile, India and Iran were positive and significant, and furthermore, all three of the between-student correlation (with aggregated teacher scores) were significant.

Finally Youdi's (1972) study of 1350 grade 11 and 12 students in the Congo likewise found that trained teachers were more successful in French and mathematics achievement, but the actual figures are not reported. Compared to other variables in the model, Youdi observes that "the average training of teachers in a school was found to be the most important independent variable in explaining the school mean scores in mathematics and ATT" (p. 99).

Finally Beebout's (1972) study of 7,674 pupils in 89 public secondary schools in West Malaysia provides strong support for the beneficial effect of teacher training. Using percent graduate teachers as the operational variable, Beebout reports a correlation of .268 between training and performance on standardized achievement examinations. When multiple regression procedures were executed separately for Malay and English medium schools, the beta coefficients were .345 and .012 respectively, indicating

greater training effects in the former. Furthermore Beebout found interaction effects between teacher qualifications and experience so when the proportion of qualified teachers in a school was high, the impact of teacher experience was low, and vice versa. This is an important insight into the interplay between teacher variables and might explain some of the null or negative findings in studies with less complete data.

Indirect support for the above findings are found in the studies by Bibby and Peil (1974), Currie (1977), Klees (1974), and Williams (1965). The first two of these studies used surrogate measures for teacher quality, namely school status and academic quality of school respectively. Bibby and Peil found that for the eleven schools and 585 students in their Ghana sample, school status was more important than home background ($\epsilon^2 = .41$; $\beta = .28$) in accounting for student examination performance. Likewise Currie's analysis of occupational careers of secondary school graduates in Uganda for the years 1954, 1959, and 1964, found that for the first and last cohorts, Betas for academic quality of school were .31 and .17; the highest of the independent variables. No explanation was given as to why the 1959 cohort showed different results, i.e. a negative coefficient ($\beta = -.14$).

Both Klees' study of Telesecundaria schools in Mexico and Williams' analysis of dropout rates in Guatemala supported the notion that trained teachers are more successful than the untrained. However their analyses are less direct and add little to the above studies, except to note the consistency of their results.

The null and negative findings must now be considered. The most important of these are Heyneman's study of Uganda 7th grade students, Ellson's experimental study of 1st grade reading gains in Malaysia using trained and untrained teachers, and the four non-positive IEA results for science (between-school) and French achievement. Although the studies by Silvey (1972) and Somerset (1968) in Uganda and Windham (1970) in Sierra Leone give negative support for the importance of teacher training, the measures are proxies, (for example, school quality) from which the effects of training can only be inferred.

As shown in Annex Table IV.6, Heyneman found the between-school correlation between teacher "status grade" (based on amount of schooling and training) and achievement to be $-.09$ and not significant. However as already mentioned, Heyneman provides his own answer for the null relationship between teacher variables and achievement in the equitable distribution of teacher quality between schools. He does not argue that his null findings provide negative proof for the importance of teacher training for maximizing student achievement (Heyneman, 1976b).

Ellson's (1973) represents one of the few attempts to investigate alternatives to teacher training for certain kinds of teaching success. His focus was on the learning of reading by first grade pupils in ten Malaysian schools. A control and experimental group, with 98 students each, were given reading instruction by trained and "unqualified" teachers over a period of 55 school days. The unqualified teachers were mature adults with only an elementary school background (6 years). The trained teachers used conventional methods while the "unqualified" teachers used programmed techniques designed specifically to assist untrained teachers in reading instruction. After the experimental period, pre-test and post-test scores were compared with the result that the experimental group showed significantly higher reading gains than the control group. Ellson contends that this evidence demonstrates the feasibility of using programmed techniques with "untrained" teachers for the rapid and inexpensive expansion of the teaching corps in poor countries to meet basic educational needs and demands.

Ellson's report merits serious attention. It is not so much a negative finding for teacher training effects, as the pupils under the trained teachers also made substantial reading gains. But the notion that some grade levels and subject areas can be taught by other than conventional methods and teachers is consistent with comments made elsewhere in this report (see footnote 10/).

Ellson's results, however, must be regarded with caution. It is possible that the greater gains of the experimental group could have been partly the result of a "halo effect", i.e. the novelty of the experimental situation. Furthermore the criterion variable in the experiment was reading ability at the first grade level, which may be more influenced by home background and teacher characteristics not related to training, for example enthusiasm or encouragement. Would the same results have occurred for science or math?

There were four null or negative results among the eight IEA correlations. However two of them occurred in between-school comparisons on science achievement where real teacher effects may be underestimated (see comments regarding Heyneman, above). The remaining two were reported by Carroll (1975) with respect to French reading and listening achievement for Chile, Population IV. It is difficult to draw conclusions from these latter two results except perhaps that in foreign language teaching, effectiveness may be determined by other factors, such as prior non-academic knowledge of the language (see #4), or teacher experience. As already shown, teacher training may have an interaction effect with experience, which, in the case of final year students, may be the more important variable.

Although the cumulative evidence from LDCs is mixed, the strongest support seems to confirm the effectiveness of teacher training in maximizing student achievement. There are sound methodological explanations for the several studies which have failed to detect training effects, such as between-school rather than between-student comparisons, and the possible interaction between teacher training effects and experience or other factors.

Unfortunately, few studies have thoroughly investigated the more subtle factors which may obscure the influence of training, Beebout and Heyneman being exceptions. Although it may be that "untrained" or "unqualified" teachers may effectively teach some subjects such as reading (perhaps writing and numeracy) in first or second grade, the evidence suggests that trained teachers would normally be required to teach more advanced subjects to middle primary and secondary students.

7. Teacher Ability and Achievement

There were six author sets among the 32 who included measures of teacher cognitive ability or performance in their investigations of student performance in LDCs. With the four replications in Lewis and Massad's IEA English report, the total number of results are nine. Of these, five reported positive findings between teacher ability and student performance, three reported null relationships, and one reported a negative relationship.

All five of the positive findings are reported from methodologically sound and valid studies and provide strong cumulative support for the importance of teacher ability as a determinant of teacher success.

In Heyneman's study of grade 7 children (N = 2,293) from 67 primary schools in Uganda, English language competence was the single teacher variable which was significantly correlated with pupil achievement. Furthermore, when this variable was included in the multiple regression equation in Block 2: "In School Influences", the variance explained by the Block (of the total variance explained) was 31.7% as compared with 47.5% for Block 1: "Pre-School Influences". While there may be explanations for the absence of relationships for the other teacher variables, the importance of teacher ability cannot be overlooked. Clearly in the Uganda context, where much of the instruction is in English, knowledge of English will be an important teacher variable.

However, Ryan (1974) complements and expands on Heyneman's finding. In Ryan's study of 797 grade 2 students in Iran, teacher ability was measured by average results of government secondary examinations. The zero-order correlation between this measure and pupil achievement was .14, and as such not impressive. However, when multiple regression analyses were performed on the separate regions covered by the study, Ryan found that the importance of ability was most pronounced in the most rural and poorest ($\beta = .353$). Ryan thus concluded that high quality teachers have the greatest impact on the more disadvantaged pupils. Not only is this finding similar to that reported by Heyneman, but it is also consistent with the results of the Coleman Report.

Of the four IEA results reported in the English as a Second Language survey, three were significant at the .01 level. For Chile, Pop. IV, achievement on both English reading and listening were related to a measure of self-perceived ability by the teacher in various English-speaking skills. Pop. II English Reading achievement in Thailand was also directly related to teacher ability, but not Pop. IV Reading Ability, which was negative. There is no apparent explanation for the latter deviant finding.

The null relationships were reported in the Fuller and Chantavanich study in Thailand and Izquierdo and Guzman's, and Schmelkes' studies in Mexico. With respect to the latter study by Schmelkes, the focus was on the effects of radio teaching on achievement in mathematics and language. In this particular context, it was concluded that the radio overcame the lack of knowledge or ability in the teacher, thus rendering teacher cognitive ability unimportant.

On the other hand, Izquierdo and Guzman investigated the importance of teacher variables on the achievement of 519 3rd, 4th and 5th grade students, and found that only one, teacher experience, was related to achievement. However a closer inspection of the authors' other findings indicated that all school facility variables correlated with achievement, suggesting that the better schools had better teachers, as well as the better students, so that there was little variance to explain in the correlations.

Finally, the Fuller and Chantavanich study of a large national sample of Thai grade 3 pupils included results of cognitive test batteries performed on the teachers, which did not correlate significantly with pupil performance either at the beginning or end of the grade 3 school year. As a result this variable was not entered into the multiple regression equation. While this study is clearly sound, it is useful to point out that the zero-order correlation was performed on the total sample, rather than stratified segments. This is particularly crucial in dealing with a national sample in a country with considerable regional disparity, which the authors document. Thus it is likely that the overall effect of teacher ability on achievement is underestimated, especially since one would not expect its effect to be uniform over the different regions (see the comments on Ryan, above).

In conclusion, it would seem that the weight of the evidence is in support of the argument that high quality teachers will produce better results among students. This relationship may not hold across all students, especially for the better ones from advantaged backgrounds. However there seems little room to doubt the importance of teacher knowledge and ability for the performance of the less advantaged, which in LDCs, is a most important consideration.

8. Teacher Experience

Nine of the 32 studies included a measure of teacher experience, but counting replications, there were a total of twelve results upon which to assess the importance of this variable. All other things being equal, it is generally agreed that a teacher gains skills through experience, and that the more experienced teacher is the more successful teacher. In their study of nine LDC studies, Alexander and Simmons (1975) concluded that experience contributes to teacher success in primary and early secondary grades, but not in upper secondary grades.

The evidence from the studies in this report generally support the above conclusion. Seven of the twelve results showed positive relationships between teacher experience and pupil achievement, two showed null relationships, and three showed negative relationships (see Annex Table V).

The studies which found positive relationships are by-and-large methodologically sound and valid and merit serious attention. As already mentioned, one of the most insightful of these studies with respect to the experience variable is that by Beebout (1972). In this investigation of 89 Malaysian schools (N = 7674), Beebout found only a modest overall relationship between teacher experience and upper secondary students in Mathematics and Language achievement ($r = .031$). However when interaction effects with teacher qualifications were taken into account, the relationship increased to .218. In other words, as the proportion of qualified teachers in a school increased, the effects of teacher experience decreased, and vice versa. As already mentioned (see #6 of this section), this finding appears extremely important for the assessment of teacher impacts in general, and is the only study which has identified and reported such a process.

Carnoy's (1971) study of the 1967 School Survey data (182,000 pupils in grades 3, 6, 9 and 12) casts further light on the impact of teacher experience in teaching success. In general, the relationships between the two were strong for the 3rd and 6th grades and weak to negative for the 9th and 12th grades. While there were few differences between rural and urban samples (the rural were slightly more positive and more negative), the overall pattern was more pronounced for reading than for general ability. This latter might have been due to the nature of the general ability examination which tapped fewer specific school-learned skills. An example of the Beta coefficients were as follows: 3rd grade urban reading = .384 compared with -.652 for 12th grade urban reading.

Carnoy's main contribution lies in the suggestion that experience is more important for earlier grades than for upper secondary, where more skill and knowledge are required.

Other important studies supporting the above findings are Thias and Carnoy's (1972) study of Kenya students on the final leaving examination for grade 7, and Husén's study of Botswana Standard 7 students on Mathematics and reading achievement.

Using seniority as a measure of experience, Thias and Carnoy found that seniority was a better predictor of examination performance than formal qualifications. They concluded that "seniority may reflect the beneficial effects of having a stable staff, since the older, more senior teachers are less likely than younger ones to be transferred to other schools, regardless of qualifications" (p. 151). Likewise Husén found very strong associations between teacher experience and achievement scores, with F-values of 4.13 and 3.80 for reading and mathematics respectively, both of which were highly significant. Husén notes that these findings may be due either to the effects of teaching experience per se, or in fact may denote that experienced teachers

are assigned to schools with better resources and students. Ultimately, however, he concludes that "... it would seem that teaching experience as such is an important factor" (p. 36).

What can be said about the null and negative findings concerning the impact of the experience variable? Heyneman's (1976b) already mentioned explanation for his failure to find significant relationships for most of his teacher variables must be kept in mind here. Heyneman found a zero-order correlation of $-.03$, NS, between teacher experience and achievement. If one can assume that teachers are graded and allocated between schools on the basis of experience as well as qualification, then the null finding does not constitute negative evidence, but only that schools in Uganda were equal with respect to teacher quality, thus with little variance for the between-school analysis to explain. Unfortunately Heyneman did not investigate the inter-relationships between the teacher variables themselves to further clarify the manner in which the teacher experience variable was distributed vis-a-vis other teacher variables, or interacted with them in association with achievement.

The remaining null and negative findings do not seriously challenge the pattern already discussed. Klees (1974), for example, reported a negative association between experience and pupil performance in Telesecundaria schools of Mexico. However his results are linked with the use of television teaching, and as with other variables in his analysis, illustrate that the television may compensate for lack of other teacher qualities. Furthermore, Klees' study was of secondary students, where, as already mentioned, the effects of experience seem to be the weakest, or perhaps the most evenly distributed between schools.

This latter explanation also applies to the two non-supportive findings reported by Carroll (1975) for Pop. IV achievement in French in the Chile sample. The fact that the sample consisted of final year secondary students actually is consistent with the contention of others that experience becomes less important for upper secondary grades.

The cumulative evidence supporting the notion that teacher experience contributes to teacher skills and success, at least for some grade levels, is persuasive. The pattern of the eleven findings reported here indicate, with some consistency, that teacher experience is most important for lower grades and least in upper secondary grades. Furthermore, the interaction between teacher experience and qualifications as reported by Beebout probably suggests that older and experienced teachers (in his sample, at least), are less likely to have the same credentials as younger teachers, or that experienced teachers have drifted to the same schools. Whatever the explanation, to reject the value of teacher experience for student performance, at least for some grade levels, would be completely unwarranted according to the evidence presented here.

9. Teacher Salary

The salary of a teacher correlates highly with qualifications and experience, which is probably one reason why it has not received much attention in achievement research in LDCs. Only three studies included measures of salary, two of which found positive relationships between it and achievement. In their study of 585 students in eleven Ghana schools, Bibby and Peil (1974) found that school status effects on Ordinary Level G.C.E. (General Level Examinations) were higher than home background effects ($\epsilon = .41$ and $\beta = .28$). Although teacher salary was not measured directly, the authors contend that status of school was a surrogate for several teacher characteristics. Thus in low status schools, it is argued that teachers are seldom qualified and their salary is frequently low and irregular. Therefore high school status effects on achievement can be interpreted as partly due to teacher qualification and salary effects.

The somewhat indirect findings of the Bibby and Peil study are supported by those of Thias and Carnoy (1972) in their study of both primary and secondary students in Kenya. Using aggregate school data and multiple regression strategies, they found that average teacher salary was significantly related to examination outcomes at both school levels. It should be noted, however, that the authors did not feel that an increase in teacher salaries would appreciably improve average student performance, since it accounted for only a fraction of total variance in performance.

The single null finding concerning the link between teacher salary and student outcome is Levy's between-country analysis of 42 LDCs, using primary school dropout as the criterion variable. Using stepwise multiple regression procedures, Levy did not find any of the four teacher variables to be significant. These null findings are probably due to the aggregation of the data at the country level, which undoubtedly masks many effects at the school or individual levels.

It would be difficult to draw any firm conclusion from the findings reported here. In all likelihood, teacher salary is highly inter-correlated with other teacher quality variables, and contributes little independent effect. Nevertheless research evidence is scant and only further enquiry can determine the policy potential of this variable.

10. Teacher Upgrading Programs

Only two studies included some measure of teacher upgrading programs and their effects on teacher success. The first of these is Husén's study of Standard 7 Botswana students, where the extent of in-service training by teachers was measured. The results showed that teachers who had participated more in in-service programs were more successful in both mathematics and reading achievement by students.

A more direct test of the effectiveness of upgrading programs is found in Nasoetion, et al (1976). This study is unique in several respects. Firstly, it is one of the few studies of teacher effects using an experimental design. Secondly, the study was coordinated with a large-scale educational development project in Indonesia to introduce new textbooks in four subjects: social science, mathematics, Bahasa Indonesia, and science. Part of the development program consisted of teacher upgrading to prepare for the new text materials. Although the development program was to be introduced gradually, grade by grade, the evaluation of its success was conducted on grade 5 students in Bahasa Indonesia achievement.

The study design called for five groups of students and teachers, according to whether new or old textbooks were used, and whether teachers had not been exposed or exposed, one, or three times to upgrading sessions. Each cell contained eight schools.

The zero-order correlation between upgrading and post-test reading achievement was .146. In general, the authors concluded that the new textbook did not result in better learning than the old textbook. However, in the multiple regression equation, teacher upgrading was found to have a positive effect on both teaching performance and student learning (the increment in variance explained (R^2) was only .1061 to .1103, or an increase of .0042, $p < .05$). It was further found that interaction effects between the new textbooks and upgrading were significant and contributed to the amount of variance explained. The wisdom of introducing both textbooks and upgrading was underscored, although the independent effects of upgrading represent an important contribution to possible policy measures for quick and inexpensive improvement of student outcomes in developing countries.

C. Teacher Behavior and Attitudes

On the whole, the effects of teacher behavior and attitudes, especially within the classroom, have received considerable research attention by educationists and social scientists in western industrialized countries (Dunkin and Biddle, 1974). In spite of the fact that cumulative research clearly demonstrates the direct effects of at least some teacher attitudinal and behavioral variables on student achievement (see, for example, Part I), there remains considerable uncertainty as to whether these variables can be taught through teacher training programs, or whether they are the result of background and personality factors. Irrespective of which alternative ultimately proves to be true, it is worthwhile to direct attention to this set of variables in LDCs as they can be policy-manipulated either way. Teacher training programs can be oriented to teaching teachers desired classroom behavior, and/or selection and recruitment procedures can maximize the intake of those candidates who are most likely to manifest the desired behavior.

In this section, attention will be directed to five variables: teacher expectations of students, teaching methods (TV, radio, etc.), teacher absenteeism and punctuality, teacher attitude toward job, and aspects of teacher behavior (homework assignment and time spent in lesson preparation). The final variable in this section is actually the Block variable used by the IEA analyses. Although the Block receiving focus is generally called "School Conditions" by IEA authors, it includes whatever teacher variables are allowed to enter the equations using stepwise techniques.

11. Teacher Expectation of Students

The so-called "Pygmalion-effect", whereby pupils conform to the expectations of their teachers, has been much discussed and researched in western countries (Rosenthal and Jacobson, 1968). Unfortunately the same has not been the case in LDCs, where only four of the 32 studies included a measure of this variable. However all four of these studies reported positive results, two of which are particularly strong and noteworthy.

The first has already been much discussed in this report, namely Fuller and Chantavanich's (1976) national study of 23,555 grade 3 pupils and 987 teachers in Thailand. Conducted in 1973, with the student achievement measures the composite of Thai and arithmetic examination scores, for both pre- and post 3rd grade attendance, the study included a variable to assess the teacher's view of the children's learning ability in terms of good, fair, or poor. The zero-order correlations (between student analyses) between teacher's perception and student achievement were .217 and .228 for beginning and end of grade 3 respectively. These values are highly significant and noteworthy by any standard. When entered into the national multiple regression equation, the variable entered 5th using stepwise procedures and increased the R^2 = from .307 to .317. On the basis of these figures, given the limitations of the methodological strategy, the support for the direct effect of positive teacher perceptions is strong.

A national study by the Philippines Department of Education and Culture (1976) on 5th and 6th grade students for achievement gains between the two grades in nine subject areas focused specifically on the effects of teacher expectation. Approximately 29,000 students were included in the 6th grade sample and 2,930 in the 5th grade (control) sample. A straightforward cross-tab analyses showed that the "teacher's evaluation of students is an important determinant of academic performance" (p. 86). Furthermore the researchers found that as the teachers evaluation becomes more positive, the students' performance increases above the levels of their own self-esteem. This finding was considered to be of "capital" importance and while still subject to verification, "should already be made to affect the attitudinal components of teacher training" (p. 87).

The remaining two studies add further support to the above findings. Durojaye (1974) studied 540 students in Standards I, II, and III in rural and urban Uganda schools. Teacher ratings of pupils were according to (i) industry and effort, (ii) punctuality and regularity, (iii) reliability and honesty, and (iv) predicted academic progress. The zero-order coefficients for rural boys and girls were .162 and .14, and for urban boys and girls were .113 and .146. While no controls were introduced, it should be noted that the coefficients between SES of student and achievement were all negative, ranging from -.541 for rural boys to -.098 for urban girls.

Finally, Rowe's (1966) in-depth study of 100 failures and 50 top students in grade 4 Hong Kong schools again underscored the importance of teacher expectations for student performance. In the only study of this design in the LDC literature, Rowe found that teacher expectations were more consistent with pupil achievement in arithmetic than in Chinese or English, which conforms to earlier discussions about the stronger school link with mathematics learning. Rowe also noted that the home environment, particularly the mother, was of "paramount" importance in explaining failure.

Although there were only four studies which included teacher expectation variables, the diversity of research designs and the consistency of results with each other, as well as with the body of literature in developed societies, give strong support to the possible effectiveness of this variable in raising performance levels.

12. Teaching Method

This variable includes those studies which have attempted to evaluate various technological alternatives to conventional teaching methods, i.e. instructional television, and various forms of programmed teaching. Insofar as these methods are only marginally related to teacher training variables which are the main focus of this report, the discussion of these four studies will be somewhat brief.

Two of the studies are evaluations of Instructional Television (ITV) in Mexico (Keeves, 1974) and El Salvador (Hornik, et al. 1973). Both of these projects have produced considerable literature (see, for example, Mayo, McAnany and Klees, 1975, and Mayo, Hornik and McAnany, 1976), but the two included here will be taken as representative examples.

The remaining two studies in this section are concerned with forms of programmed teaching: Okunrotifa's (1975) study of Nigerian 8th grade students' achievement in geography and Ellson's (1973) study of reading achievement among 1st grade students in Malaysia.

All four of these studies reported positive findings in favor of the alternate teaching method. Thus Klees and Hornik both report that students exposed to ITV in Mexico and El Salvador show higher gains, than those exposed to conventional teaching methods. Likewise, Okunrotifa and Ellson report that there were higher achievement gains by students exposed to teachers who were using programmed methods, even though, as in the case of Ellson's study, the teachers were "unqualified".

No doubt these studies give consistent and strong support to the possibility of alternative teaching strategies to bring about "rapid" and perhaps less-expensive improvements in student performances in LDCs. However, until more extensive experimentation and evaluation is pursued, these alternatives must be regarded with some caution. Carnoy and Levin (1975) raise two major objections to current evaluation studies of the type represented here. The first, the "benefit of the doubt bias", derives from tendencies to underestimate the true cost of these alternative teaching forms and to disregard other related factors, such as student selectivity. The second objection, the "ignoring other effects bias", derives from concerns about unquestioned assumptions underlying the use of alternative instructional methods, for example, the urban curriculum which is telecast into rural areas, assuming its effectiveness and relevance for rural teenagers.

It would seem that there is much research yet to be done before these teaching forms can be considered viable alternatives to face-to-face instruction by competent and concerned teachers.

13. Teacher Absenteeism and Punctuality

Only two of the 32 studies included measures of this aspect of teacher behavior. On the surface it would appear that absenteeism and punctuality are related to other teacher behaviors and attitudes, since job interest or responsibility might be affected, and thus teaching effectiveness as well.

However both studies report null relationships. Fuller and Chantavanich (1976) found that correlation coefficients for punctuality were .062 and .066 for beginning and end of grade 3 achievement. Furthermore, when added to the national multiple regression equation, the variable entered last according to stepwise techniques and added virtually nothing to the total variance ($\beta = .012$, NS).

Izquierdo and Guzman (1971) also included a measure of teacher punctuality in their study of 519 grade 3, 4 and 5 pupils in Mexico. The zero-order correlation was .077, NS, between this variable and mathematics and language achievement.

The little evidence which exists, seems to indicate that teacher absenteeism and punctuality are not important teacher factors in the explanation of variations of student performance.

14. Teacher Attitudes Toward Job and Career

As with the previous variable, one would expect that the attitudes toward teaching would affect teaching styles enough to make a difference in student outcome. The overall evidence, in the results here, however, is mixed.

Five of the 32 studies included measures of teacher job-related attitudes, two of which reported positive associations between attitudes and pupil performance, and three reported null association. None of these studies can be regarded as providing strong support or lack of it, for the hypothesized relationship, because of ambiguities in measurement (i.e. the use of "proxies") or methodological weaknesses.

Ryan (1974), for example, found a .17 correlation between teacher "frankness" and pupil performance in language and mathematics in his study of 797 grade 2 students in Iran. Furthermore, the significance of the variable remained when entered into the regression model for the total sample ($\beta = .121$, R^2 change = .013), and for two of the three regional subsamples, namely the two most rural and disadvantaged. However, it should be noted that "teacher frankness" was inferred from the teachers' openness and willingness to discuss local issues, and furthermore was used as a "proxy" variable for job security. It does not represent a direct measure of job related attitudes.

Durojaiye (1974) found in his study of 540 Ugandan secondary students that a positive attitude toward teaching pupils was significantly related to achievement for urban boys and girls ($r = .253$ and $.212$) but not rural ones ($r = .011$ and $.073$).

Among the null findings are those reported by Klees (1974), Izquierdo and Guzman (1971), and Somerset (1968).

Starting with the latter, it must be noted that Somerset only inferred teacher morale from the quality of the secondary schools in his Uganda study of Cambridge School Certificate candidates. Furthermore school quality was measured on the basis of average examination scores by students in the school. The addition of school quality made only an infinitesimal increase in variance explained (Multiple $\beta = .3804$ to $.3807$).

Izquierdo and Guzman's study of 519 grade 3, 4, and 5 Mexican students measured teacher attitudes more directly, but found a very small correlation, $r = .002$, NS. Likewise Klees (1974) found that teacher attitudes towards his or her job were unrelated to achievement in his study of Tele-secundaria students.

The evidence here is mixed, and there are many reasons, already mentioned, why this is the case. Until more focused and direct studies of teacher career attitudes are available, any conclusions regarding this variable in LDC teacher training policies must be regarded as tentative.

15. Teacher Behavior

This variable includes the IEA measures of the extent to which teachers assign homework from student reports of hours spent doing homework and time spent on lesson preparation. One would expect that both of these behavioral characteristics would be favorably related to higher pupil performance. The evidence, however, is not clear.

Comber and Keeves (1973), for example, report five between-school zero-order coefficients and ten between-student coefficients relating hours students spend at homework and science achievement (see Table IV.15). Of the between-school coefficients, two are positive and significant, while the remaining three are non-significant (though positive). In the between-student comparison, five are significantly positive while five are not. There seems to be no consistent pattern by population, although by country Indian students who do homework seem to be more successful in science, than their counterparts in Chile or Iran.

With respect to hours spent in lesson preparation, there is a slight positive pattern which would suggest that this kind of teacher behavior is likely to result in greater student success in English as a second language.

Overall, the evidence from these two facets of teacher behavior do not provide clear guidelines which might be incorporated into teacher training policies. While the evidence is limited to zero-order relationships, with no controls, the nature of the IEA samples, the three age levels, and the four LDC countries suggest that the absence of consistent patterns should be taken seriously, at least until further research is forthcoming.

16. School-Teacher Block Variables (IEA Studies)

This final section represents a departure from the previous 15 teacher variables, in that it does not deal with individual teacher variables, but Blocks of variables which include school related variables as well, for example, in the IEA science analyses, number of laboratory assistants and the school behavior scale. In most of the IEA reports, this Block was identified as relating to the learning condition in the school.

A further departure from the previous fifteen variables concerns the number of reporting the findings. The IEA volumes typically reported the amount of variance explained by each Block of variables for the total variance in achievement. Thus, in this brief survey, the amount of variance explained by the School-Teacher Block is compared with the variance explained by Block 1, or the students' home background. The rationale behind this procedure is simply to compare the relative importance of school-teacher variables with home background variables, since these two have been the major focus for the current discussion of the determinants of student achievement. Where the proportion of variance explained by school-teacher variables is equal to or exceeds the variance explained by the Home Background Block, a "+" is recorded; where this is not the case, a "0" is recorded.

Overall, the general conclusions from the IEA studies was that "school variables appeared to have relatively little power in accounting for variations in achievement ..." (Platt, 1975:38). However if one inspects the importance of the school variables relative to Home Background variables, in the four LDCs as given in Table IV.16, this does not appear to be the case. Of the 56 comparisons available, the variance explained by the school-teacher block equals or exceeds that of the home background block in 41, or 68% of them. A couple of examples will illustrate the point. In India, Pop. I (10-year-old), science, 20% of the variance is explained by the school-teacher Block, compared with 1% by the Home Background Block. In Chile Pop. I, reading, the school-teacher Block accounts for 8.3% of the variance compared with 1.4% by the Home Background Block.

Are there any patterns either by subject, age level, or country which emerge? The answer is clear. In all subjects except literature, the School-Teacher Block accounts for equal or more variance than the Home Background Block. In general it appears that the School-Teacher Block explains more variance relative to home background variables for the Pop. I results, or the younger pupils. Finally, by country there seems to be a marked contrast between Chile, on the one hand, and India on the other. With respect to the former, the school-teacher variables are much weaker relative to the home background variables, as only 8 of the 20 results are positive. For India, the reverse pattern applies, as 22 of 24 results show the school-teacher variables to explain more variance than home background variables.

One should not exaggerate the implications of these trends for teacher training policy in LDCs, since the analysis by blocks obscures the unique importance of teacher-related variables. Furthermore, as already noted, the teacher variables differ from analysis to analysis, depending on whether they met the prescribed criterion for entry into the regression equation.

Nevertheless the overall pattern, as well as the subject, age and country variations is impressive. In contrast to the observations of Platt and others regarding the entire set of IEA findings, the results for the four LDCs seem to clearly indicate that relative to home background variables, the school-teacher variables are very important in explaining variations in student achievement. This pattern for the LDCs should be taken seriously, as it not only supports findings already discussed for the 15 specific teacher variables in this section, but underscores the differences between developed and less developed countries with respect to the determinants of student achievement.

IV. CONCLUSIONS AND POLICY RECOMMENDATIONS

The mandate for this review was to locate and critically assess relevant researches which investigate the impact of teacher variables on student outcomes in less developed countries. Section I of this review briefly described the background of this project and presented some findings from similar reviews of studies in western industrialized countries, mainly North America and the United Kingdom. Section II outlined the format within which the literature was organized. The 16 teacher variables were described. In Section III, the evidence for the importance of each variable was described and assessed.

The search located 32 separately authored studies which investigated teacher effects in LDCs. However some studies included several replications, either by grade level, criterion variables, or by country. Counting each of these separately, there were 64 studies to analyze.

(i) Some Comments on the Interpretation of Results

As described in Appendix A, some conceptual and methodological considerations should be kept in mind when assessing the findings of these studies.

The 32 studies included a variety of research designs and methodological strategies. On the basis of the observations in Appendix A, many of the results discussed in this report must be regarded as tentative and possible underestimates of true relationships between variables. Cross-tabular analyses and zero-order correlation coefficients do not take control variables into account, and thus there is always the possibility that a relationship might be spurious and due to intercorrelation with another variable. Thus, for example, the correlation between teacher age and achievement might be due to the fact that older teachers are more experienced and also more stable.

Many of the results considered in this report are in the form of zero-order relationships, which are particularly vulnerable to the above limitations. However, rather than dismiss them altogether, it is more practical to utilize these findings as preliminary indicators of the real link between teachers and pupils. Until more sophisticated research is available, some information is preferable to none, especially where policy-making is concerned.

(ii) Summary of Findings

Conclusions for each teacher variable are briefly summarized as a prelude to the policy recommendations.

1. Teacher Sex shows mixed results, but generally male teachers seem to be more successful with science achievement, while females appear more successful with subjects like English and French as foreign languages. Furthermore, males seem to be more successful in early grades, at least in some countries.

2. Age of Teacher is equally mixed in results, but there is some evidence that for the later secondary grades, older teachers are more successful than younger ones.

3. Teacher SES effects are contingent on the social structure, though in general teachers from higher status backgrounds are more successful than teachers from lower status backgrounds.

4. Frequency of English in Childhood Home is a variable which has relevance in countries where English is a medium of instruction rather than the native tongue. In the one case where this variable was measured, it was unrelated to student achievement.

5. Teacher educational attainment also produced mixed results, however teacher schooling did emerge as more important for primary and early secondary grades, and for those subject areas requiring special skills, such as science, mathematics and literature.

6. Teacher credentials and certification are clearly important for successful teaching. Although the overall evidence is somewhat less than unanimous, the more complex and thorough studies provide strong evidence for the positive effects of teacher training on student outcomes.

7. Teacher ability and achievement are important teacher qualities for student achievement, especially for the more disadvantaged students. The most thorough studies of this variable indicate that intelligent and knowledgeable teachers produce high student performance.

8. Teacher experience is important for student performance in primary and early secondary grades, but less so for upper secondary grades. This finding is consistent with those of earlier literature surveys.

9. Teacher salary does not emerge as a consistently important variable in maximizing student achievement. The ambiguous results are probably due to the high intercorrelation between teacher salary and other teacher variables.

10. Teacher upgrading programs have received little attention in the research literature, but the two studies reviewed in this report suggest that such programs are effective.

11. Teacher expectations of students are among the most consistently important variables in the achievement literature. Positive teacher expectations of students produce positive results.

12. Teaching methods such as instructional television and programmed instruction have been found to correlate positively with student achievement. However the research so far has been seriously questioned and the findings should be regarded with caution.

13. Teacher absenteeism and punctuality, although only little researched, do not seem to be important teacher characteristics in relation to student performance.

14. Teacher attitudes toward job and career did not clearly emerge as an important variable, in spite of sound theoretical reasons why it should be so. Until further evidence is forthcoming, the relationship between positive job attitudes and student performance must be regarded as mixed and ambiguous.

15. Teacher behavior, operationalized as the assignment of homework and time spent preparing lessons, did not clearly emerge as an important variable and thus of dubious value in teacher training programs, at least in isolation from other more important "trainable" teacher characteristics.

16. School-Teacher Block variables (IEA studies) provided overwhelming evidence that at least in LDCs, the conditions surrounding the school and teachers are important in accounting for variations in student achievement. The evidence was strong and atypical in comparison with the results for the developed countries in the IEA samples.

Some comment is required in order to avoid simplistic interpretations of the mixed evidence found among the 32 studies covered in this report. The findings can be summarized for all samples and all variables together in Table I, designating a statistically significant positive effect by "+", no effect by "0", and a negative effect by "-". Although the results in Table I are mixed, a clear pattern can be seen: the bulk of the studies show significant positive effects, a smaller number show no effects, and few show negative effects.

Table I: SUMMARY OF FINDINGS FOR ALL SAMPLES AND ALL VARIABLES TOGETHER

	+	0	-	Total
Number	110	65	19	194
Per cent	57	34	10	100

Studies concerned most directly with teacher qualifications (educational attainment, credentials and certifications, ability, experience, salary, and upgrading programs) are summarized in Table II. Again the pattern is clear:

Table II: SUMMARY OF FINDINGS FOR VARIABLES CONCERNED WITH
TEACHER QUALIFICATIONS

	+	0	-	Total
Number	35	22	6	63
Percent	56	35	10	100

the bulk of the studies show positive effects, a smaller number show no effects, and few show negative effects.

Some studies summarized above should be given greater weight than others, due to the variables examined and the analyses carried out. In Table III, therefore, the results are summarized for 11 carefully selected studies. Three criteria were used in this selection: (1) the studies related specifically to teachers' years of training or type of qualification; (2) the studies report results of analyses involving either experimental or statistical control for student background characteristics; and (3) the teacher training variable is measured rather than inferred from salary or other school or teacher characteristics. 12/ Here again the pattern is clear:

Table III: SUMMARY OF FINDINGS FOR ELEVEN-SELECTED STUDIES CONCERNED
WITH TEACHER TRAINING

	+	0	-	Total
Number	6	3	2	11
Percent	55	27	19	100

the majority of studies show positive effects, a smaller number show no effects, and few show negative effects.

12/ The studies included here are: Beebout (1972), Bibby and Peril (1974), Carnoy (1971), Carroll (1975), Currie (1977), Ellson (1973), and Fuller and Chantavanich (1976). Each sample and each measure is counted as a separate study. The reader is referred to ANNEX Tables I, III, IV and V for details.

It is maintained that the observed distribution of the results of the studies reported here reveal a pattern which is not consistent with the null hypothesis (the hypothesis that teacher characteristics have no effect on student achievement). This can be illustrated in Figure I. If the null hypothesis prevailed, i.e., if teacher characteristics did not have any effect on student achievement, sampling error and non-random measurement error would lead to an observed distribution of estimates of teacher effects on student achievement centering on zero, as illustrated by Curve I. The bulk of the studies would show no effects, and a few would show positive effects and approximately the same number would show negative effects.

Figure 1

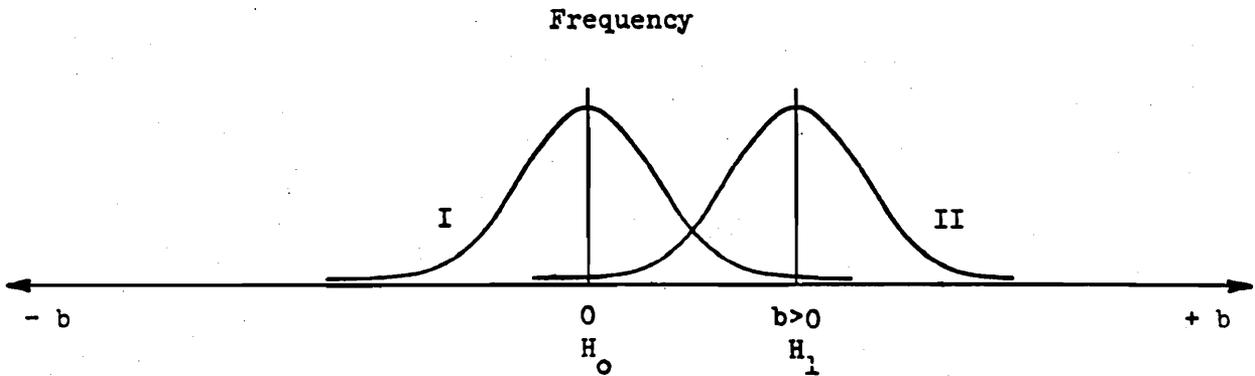


Figure 1. Distribution of Observed Estimates Under H_0 and H_1

In the studies reviewed here, however, the distribution of estimates of teacher effects clearly centers on a value greater than zero, as illustrated by Curve II. It may, in summary, be concluded that the results reported here constitute evidence of a positive effect of teacher characteristics on student achievement and are inconsistent with the null hypothesis. It should be noted here that the two analyses presented in Part II of this report give further support to this conclusion. If these two analyses were added to Table III, the percent figures in the table would be 62 percent "+", 23 percent "0", and 15 percent "-". The studies in Part II are of special importance since they were designed specifically for the purpose of testing the effect of teacher training taking into account all the problems we are aware of in the studies reviewed here. Further studies using better controls and more precise instruments will be required in order to obtain a satisfactory estimate of the magnitude of the effect of teacher training and other teacher characteristics.

Overall, one can conclude from the evidence of the 32 studies covered by this report, that at least some teacher variables have emerged as very important in explaining variations in student achievement in LDCs. By far the most impressive evidence focused on variables linked with teacher qualifications and credentials. Contrary to the arguments presented elsewhere, the evidence here suggests that trained teachers do make a difference. Furthermore, teachers with more experience and with higher levels of ability and knowledge appear more successful than those not so well endowed. However, these statements need some qualification, since apparently these consequences of competence do not operate out of specific social and cultural contexts. Thus, for example, it seems that credentials are more important for those subject areas which require special skills and knowledge, and which are much more dependent on the school for learning, such as mathematics and science.

On the other hand, teaching experience appears more important for the primary and lower secondary grades, which is near the primary levels for which "untrained" teachers may act as substitutes for the trained, given appropriate programmed teaching instructions. But whether this latter practice will work for any subject area is a matter for further research.

With respect to teacher demographic and background characteristics, again the evidence is somewhat ambiguous. What is certain, however, is that there are differences between young and old, and males and females, with respect to teacher effectiveness. Naturally the effects of these two variables are contingent upon specific contexts. However, at least in some countries, it seems that males are more successful for early grades, and the older teachers seem more successful in the secondary grades. The slight discrepancy between the findings with respect to age and experience is not clear, but there may be interaction effects between these two variables which merit further investigation. Finally, teachers from upper status backgrounds are generally more effective than those from lower status origins.

Attitude and behavior variables do not present an altogether clear picture either. Without question, favorable teacher expectations of students are extremely important for successful student performance. However, it seems that aspects of teacher behavior such as absenteeism, punctuality, giving homework or preparing lessons, and attitudes toward one's job, are all moderately or of minor importance.

A final observation must be made at this point. The interaction effects found to operate between teacher credentials and experience is an important factor to keep in mind. Few studies have actually examined interactions between teacher variables with respect to student outcomes. Yet the inconsistency of some of the findings may be due in part to interaction effects. Thus until we know more precisely within what contexts certain variables have an effect, we will be unable to completely understand how teacher characteristics produce results in the classroom.

(iii) Some Unresolved Questions

The studies reviewed in this document provide us with a fairly comprehensive picture of the importance of some teacher characteristics for student achievement. Nevertheless several questions outside the scope of this report remain unanswered, but should be noted because of their possible influence on policy-making for teacher training programs in LDCs. These questions concern: (1) threshold effects of teacher training, (2) the effects of teaching styles, and (3) the relative efficiency and costs of alternate programs for teacher training.

(1) Threshold Effects:

Frequently during interviews with experts for this report, the problem of "how much" teacher training was raised. In other words, it was often felt that beyond a certain "threshold", additional teacher preparation would likely prove unimportant in raising performance levels in developing countries, thus wasting scarce resources, both in terms of costs and facilities.

However, this upper threshold, whatever it might be, was not felt to be of immediate concern for teacher training programs in most LDCs and thus the expansion and upgrading of existing programs was seen to be a viable goal for the improvement of educational systems.

Unfortunately none of the studies reviewed in this report took threshold effects into account, either directly or indirectly. Thus, for example, when Thias and Carnoy (1972) calculated the marginal gains in earning through schooling for each unit increase in teacher salary (linked to credentials) they did not consider an increase beyond which the gains would diminish or cease to occur. However, it is clear that such a limit would most likely occur.

Therefore we still know virtually nothing about the critical lower or upper thresholds which set boundaries to rational and economic improvements in teacher selection and preparation. Clearly more research into this question is needed for rational planning in LDCs.

(2) Teaching Styles:

The effects of teaching style on student outcomes, both cognitive and non-cognitive, have been thoroughly researched in North America and the U.K. (see, for example, Gage, 1963, and Rosenshine, 1971). While in most instances teacher style, such as authoritarian or non-authoritarian methods, has been found to be important for certain kinds of students and in some subjects, few overall generalizations regarding this variable have been forthcoming.

Again, as with the previous discussion, none of the studies consulted for this report included direct measures of teacher style. Thus empirical evidence from LDCs regarding this aspect of teacher characteristics is simply not available.

However, there has been speculation and exhortation about appropriate and effective teacher styles for LDCs. For example Cole and Bruner (1975) argue that teachers of disadvantaged children would be more successful (in terms of student performance) if they "stop laboring under the impression that (they) must create new intellectual structures, and start concentrating on how to get the child to transfer skills he already possesses to the task at hand" (p. 121).

Nduka (1974), writing on needed educational reform in Nigeria, has argued that non-authoritarian teaching methods are necessary in African schools to create critical and open minds which are essential for learning the skills of mathematics and science. He feels that this orientation is essential to counteract the strong non-critical and "closed" cultural traditions of African thought patterns.

In both of the above examples, the authors assume that teaching styles influence learning outcomes. We must know more about this set of variables, specifically as they are appropriate for effective and efficient teaching in different societies and cultures.

(3) Alternative Programs for Teacher Training:

Teacher training, even in LDCs, generally follows a traditional western pattern and as such is conservative and expensive with respect to local needs and resources (Husén, 1977). It is legitimate, therefore to ask whether alternate programs might be possible and feasible, at least in some developing countries.

Implicitly, a number of alternate teacher training programs are suggested by studies in this report, for example the use of upgrading or inservice training schemes, especially for poorly trained teachers, and the retraining of teachers for new curricula (cf. III:10). Likewise, programmed teaching materials with relatively untrained personnel have also proven successful, at least in early grades and for some subjects, as well as the use of instructional television and radio (cf. III:12). Unfortunately none of the literature examined for this report provided clear evidence that these alternate strategies were either more efficient or less expensive than the use of conventionally trained teachers in face-to-face teaching situations (Carnoy and Levin, 1975).

It may be that a combination of alternative strategies might be useful in some situations. For example, Husén (1977) has recently suggested that teacher training should take place both in and outside of institutional settings. Pre-service training of short-term duration might be feasible for primary education and could provide a rapid and plentiful supply of teachers

at this expanding educational sector. As in Botswana and Tanzania, the source of these teachers could be in the form of national service programs for school leavers, at least temporarily (Husén, 1977; Mmarai, 1977). Formal teacher training colleges could then be reserved for those who had, on the basis of their primary teaching service, decided upon a teaching career, especially at the more advanced levels.

Whatever the alternate strategies, and they are many, it is necessary that experimental research be specifically designed to assess both their cost and effectiveness. Finally, alternate strategies should be chosen only after the social, cultural and demographic features of the country have been carefully considered. Otherwise alternate strategies could be detrimental in the long-run to the improvement of education in developing contexts where literate and trained manpower is needed.

(iv) Policy Recommendations

On the basis of the conclusions of the previous section, the following policy recommendations are suggested:

1. No program for teacher training and teacher allocation should be designed and initiated in LDCs without first acquiring a thorough knowledge of the demographic, structural, and cultural context within which the program is to function. These contextual factors should not be taken lightly, as they can considerably affect the success of even the best qualified and trained teachers. Furthermore, one cannot assume that all LDCs are alike with respect to educational processes. Differences between some LDCs may be greater than between LDCs and developed countries.

2. Efforts should be made to increase and improve teacher training programs in LDCs. Furthermore, short-term teacher upgrading programs would be effective for those teachers already in the profession but who have not had extensive training.

3. Selection and recruitment of teachers should be made with a knowledge of their most effective use, i.e., that male teachers will likely be more successful than females in teaching mathematics and science, and so forth. Naturally these allocations can only be made with the full knowledge of the cultural context within which they are made, especially the social roles and status of males and females, age groups, and the nature of the status structure.

4. A major focus of teacher training should be on the development of teacher knowledge and ability in specific subject areas.

5. Emphasis in teacher training programs should be on developing favorable teacher attitudes towards students. Furthermore, teacher trainees should be made aware of the impact of their expectations of students on subsequent performance.

6. Where programmed teaching and relatively untrained teachers are used, their use should be restricted to the early primary grades and for those subjects which have strong links with cultural and other outside agencies, for example reading.

7. Attention should be directed to the most productive use of experienced teachers, especially those with less training, by using them in the primary grades.

8. Further research should be undertaken in LDCs in the unique relationships between teacher and student, and their impacts on learning. Specific attention should be directed to the interactions between particular teacher variables, and how these variables relate to learning.

9. Research should be directed to the location of "threshold" effects of teacher competence variables, that is, at what point does additional training cease to be effective, and for what grade levels, subject areas, and so forth. Currently we have virtually no information on teacher competence "thresholds", and in the case of LDCs such information could have important financial and educational consequences.

(v) Suggested Design for Future Research

Following this review of 32 studies of teacher effects in LDCs, it is apparent that many gaps still exist in our knowledge and understanding of the learning process, and the role of the teacher in this process. Thus it is appropriate that this review end by volunteering suggestions as to the content and design a research project might take in order that some of these gaps be filled.

First, it should be realized that research on any one LDC cannot be readily extrapolated to another LDC, any more than research from developed countries can be extrapolated to LDCs. Thus the most ideal study would be one where several different "types" of countries are included, with exact replications for each country.

Secondly, it is clear that more studies of an experimental nature are desperately needed. Straightforward survey research has made a considerable contribution to our knowledge of education in all countries. However, in order to test specific hypotheses about teacher variables, and furthermore to avoid some of the pitfalls of achievement studies to date, accounting for student gains with pre-test and post-test results for experimental and control groups may add much to our present knowledge.

The characteristics of teachers should be linked with their students for the different cognitive outcomes. Analyses should be made at the between-student level rather than aggregated school or country levels.

Finally, close attention should be directed to the interrelationships between specific teacher variables, and possible interaction effects should be investigated.

It would be difficult to present more specific directives for possible research designs. The suggestions presented above derive from the body of research covered in this report, although any effective design would of necessity take into account the country, demographically and culturally, within which the study would take place.

Ultimately, future research should not be preoccupied with the question of whether trained teachers make a difference, since that question has already been answered by cumulative research evidence. The question which remains unanswered is how, and because of what qualities and in what contexts do teachers make a difference. Answers to these questions will make significant contributions to our understanding of the teacher-learner process generally, and in LDCs, and will help improve schooling outcomes in a manner most congruent with LDC needs. Agencies involved in the financing of teacher training programs are in a unique position to promote experimental and controlled non-experimental studies on the effects of teacher training on student achievement. Such evaluation ought to be an integral part of any such financing effort as a way of assuring efficient use of development resources.

APPENDIX A

SOME PROBLEMS IN THE INTERPRETATION OF RESEARCH FINDINGS

As mentioned at the conclusion of Section I, the interpretation of school achievement studies in LDCs in the light of findings from developed countries is not always an easy task. Both in terms of the social and cultural context of schooling in LDCs, and the methodological procedures in many recent LDC studies, there are grounds for suspecting that the real relationship between teacher training characteristics and student performance is somewhat underestimated. Thus the conclusions of this literature review should be regarded as conservative statements about the probable gains to student achievement through the upgrading of teachers in LDCs.

In this appendix, two types of factors which might obscure real teacher effects are discussed: 1) factors related to the experience of schooling in LDCs, and 2) factors related to methodological procedures used in some LDC achievement studies.

A. The Educational Experience in Less Developed Countries

First it will be useful to raise some issues that relate to the assumed differences between developed and less developed countries in the educational experience of students. These issues might be crucial since they could affect the extent to which conventional theoretical and empirical models of educational processes can be used equally in developed and less developed societies in the analysis of education. They might also help to highlight possible differences in the expected roles and performance of teachers.

In most current educational research it is generally assumed that differences in educational processes (outcomes) represent differences of degree rather than kind. In other words, the reasons for the lower performance of students in LDCs (as documented in the IEA studies) are said to be less adequate physical facilities, poorly qualified and untrained teachers; and deficient pre-school and home environments. In support of this position, Simmons (1974) has argued that learning behavior "appears to share common mechanisms across cultures", and that the burden of proof rests with those who question this position.

Some evidence, however, calls into question certain assumptions about schooling outcomes in LDCs. These can be classified into three categories: 1) the effect of schooling on cognitive development, 2) cross-cultural differences in cognitive processes, and 3) differences in the school experience. Each of these will be briefly discussed.

(1) In LDCs, to what extent is schooling preferable to no schooling for the development of cognitive abilities?

Those who minimize the importance of school and teachers implicitly suggest that either the school is an unimportant agent for cognitive development, at least in some cultural contexts, and that to attempt to improve school efficiency by increasing school resources, such as teacher training, will produce negligible results.

A major obstacle in testing this proposition stems from the fact that it is virtually impossible to investigate the relative advantages of schooling since, in most societies, it is now difficult to find control groups who are unschooled. Nevertheless two studies have been located, that by Fahrmeier (1975) in Nigeria and Sharp and Cole (1974) in Mexico, which make recent contributions to the discussion.

With respect to Fahrmeier's study in particular, children between the ages of six to thirteen were tested for level of cognitive development and, as expected those who attended school showed higher level of ability than those who did not attend. However, an unexpected discovery was that the gap in ability between the schooled and the unschooled remained constant for each age group. In other words, at point of entry into the schools, those who did enter already manifested higher levels of cognitive development (the result of a selection process already apparent). Yet, through maturation and exposure to other agents of socialization and learning, the unschooled also developed intellectually. Thus given the original differences between the two groups, schooling bestowed little additional advantage in the acquisition of cognitive skills, nor were its effects cumulative.

By contrast, Sharp and Cole (1974), in their investigation of 446 individuals between the ages of 14 and 61+, and from both traditional and non-traditional Mexican towns, concluded that in spite of clear age effects, schooling exercised a "profound effect" on cognitive abilities.

What is suggested in these and similar studies is that in highly traditional societies there may be some intellectual development, at least regarding cultural learning, outside the school, through extended families, elders, rituals, and other means (Akinpelu, 1974). In contexts such as these, the effects of teachers will be partly obscured or even contradicted by these factors.

Unfortunately, not enough systematic and rigorous research has been conducted on the complex inter-relationship between the culture of society and the school, especially with respect to student achievement in LDC schools.

(ii) To what extent are cognitive processes of people from different cultures shared?

Another issue concerns the extent that cognitive styles differ between cultures. Those who maintain large differences say that cross-cultural comparisons of achievement on standardized tests, and even the use of standard statistical models in the analysis of achievement data, may be questionable.

For example Gladwin (1970), in his study of logical thinking among the Puluwar islanders in the South Pacific, argued that cognitive measurement instruments and other achievement tests are intended to measure the way information is categorized and organized, rather than the way it is processed and manipulated. Thus Gladwin contends that children from cultures other than the western middle-class are likely to perform less well on such tests, and by implication appear less competent. However he argues that they may be highly competent, but according to criteria not measured by conventional achievement instruments. Thus teachers may manifest different degrees of success depending on the subject taught and the cultural traditions of the students' environment.

This position is supported by the earlier research of Gay and Cole (1967) on the mathematics ability of members of the Kepelle tribe in Nigeria. After developing two sets of mathematics problems, one based on conventional tests, the other based on the cultural and environmental setting of the Kepelle, the researchers administered both sets to a sample of Africans and Americans. In both samples, individuals excelled on the problems appropriate to their culture and scored poorly on those derived from the other cultural context.

The implication here is that the interpretation of achievement scores and other outcome variables based on presumed standardized tests may, in fact, obscure the real link between teachers and student performances. Thus the comparison of these test scores across cultures is somewhat problematic, particularly in attempts to compare the importance of background and teacher effects in a given context with respect to given cognitive outcomes.

In contrast to the view which posits the "psychic unity of mankind" (and thus "shared" learning processes), an alternative position contends that differences in substantive knowledge and problem-solving abilities represent more profound and fundamental differences in logic and other thought processes. Gladwin (1970), for example, has argued that these processes are culture-bound.

"There are already in existence numerous comparative studies of cognition in different cultures (Tyler, 1969). However, with but a few rare exceptions these have been concerned with the frameworks within which information is organized for use, frameworks which have been variously called cognitive maps, semantic frames, or ethnoscience. Yet the differences in cognition between middle-class and poor people in the United States seem to lie more in the way information is processed and manipulated than in the way in which it is categorized and organized. If this is true, the critical differences should be sought in styles of thinking, problem-solving, and planning." (Gladwin, 1970:218)

Thus both positions in this issue affect the interpretation of achievement study findings, particularly in LDCs. For example, in studies of test results, it is generally found that children in LDCs score lower than those in developed countries, and thus one might conclude either: 1) that by upgrading schools and teachers in LDCs, greater comparability in test scores might be obtained, or 2) that the differences are due to more fundamental cognitive processes and less amenable to policy intervention without radically changing the culture context.

Clearly whatever policy recommendations one makes will, to a large extent, depend on how one interprets or explains the differences in achievement results. There is much room for further investigation of this culture-cognition problem.

(iii) To what extent is the experience of schooling comparable across cultures?

This question concerns the continuity between school and culture, and whether there is harmony between school and other cultural agents, for example the family, religion, power structure, and the knowledge system. It has been observed that in some traditional cultures, especially those found in LDCs, this question may be important.

In the first place, it has been argued that in traditional societies much cultural (moral) education is likely to occur outside the school. It is often forgotten that the school is an innovation of western cultures, and in its present form, represents a western "import" into non-western environments. To this extent it has sometimes been found to lack relevance with respect to the cultural needs of the students who experience it, and may be poorly suited to the training of technological and scientific skills, the results are that standard teaching and learning processes may seem to produce minimal outcomes (Akinpelu, 1974; Leacock, 1972).

There are several reasons which might explain the lack of relevance of schools in some LDCs. To begin with, there is often little recognition of or knowledge about, the traditional educational processes. There can be little doubt that complex informal educational systems exist in many traditional societies, through which highly valued cultural knowledge is transmitted, such

as family members, religious leaders, village elders, and peers (Akinpelu, 1974). In many contexts, a teacher who is an "outsider" to the culture, using materials and techniques which are unfamiliar in a setting (the school) which is equally strange, can experience only limited success. As Akinpelu has observed, "... whereas the parents in western culture tend to 'thrust' out their children whereas others to train rather early, in the non-literate societies, the parents and the family assume greater responsibility in, and spend longer time on, the training of their children" (p. 418).

It should be noted, however, that in these traditional societies, the teacher is virtually the only source of most technical and scientific knowledge as few other persons in the immediate social and cultural context are likely to possess this kind of expertise. Thus the teacher's importance for the mastery of this knowledge cannot be overestimated. Yet schools in LDCs, particularly if the language of instruction is not the mother tongue, tend to teach more than technology and science; western cultural values are also imparted.

A second consideration thus concerns the potential conflict between the values of traditional societies and western education. This can be illustrated by pointing out the lack of relevance which sometimes exists in much of curriculum content in LDC schools. For example, Coleman (1972) has argued that one of the basic functions of the school is to provide the child with a vicarious experience of the adult world, including both social and interactional structures, and the physical world. Yet it has been observed that the content of subjects taught in some LDC schools lack this relevance. Books are frequently imported from western countries, and often are outdated castoffs (Leacock, 1972). The curriculum is oriented towards the successful completion of external examinations, which are set in former colonizing countries, and which often require the mastery of knowledge and skills which bear little relevance to the cultural context of the host society. Thus the vicarious experience of children in some LDC schools is of a society which is completely foreign to them, and which, for the most part, they will never experience.

B. Some Methodological Considerations

In addition to the above framework within which results of studies of student achievement in LDCs must be assessed, there are a number of methodological difficulties which must also be considered. While the following observations pertain equally to studies in developed and less developed societies, they are offered with particular reference to the studies which are reviewed in this report.

Most studies relevant for the analysis of teacher effects have used survey research designs and have focused upon students or schools as the units of analysis. ^{1/} The most common statistical operations have been based on OLS regression techniques, usually following analysis of variance strategies, either by increment in variance-explained procedures or disaggregation of variance-explained strategies. The initial model upon which many of these studies were built is from the original Coleman Report (1966), the criticisms of which are numerous and well-known (Bowles and Levin, 1968a, 1968b; Cain and Watts, 1970; Hanushek and Kain, 1972 - to name just a few).

The basic equation for most of these studies has been derived from the Education Production Function (EPF). In brief, the EPF focuses on the educational outputs of schools (usually in the form of achievement scores) as functions of various school inputs (usually the background of students, teacher characteristics, and other school facilities). The EPF model has been adequately described and criticized elsewhere, and these will not be repeated here (see, for example, Alexander and Simmons, 1975; Lueke and McGinn, 1975; and Brown, 1975). However a number of specific problems must be kept in mind when assessing the LDC studies of teacher characteristics and achievement.

(1) Aggregation of data

In virtually all studies of achievement, school and teacher variables have been aggregated at the school level, while student variables have been used at the individual level. Thus one assumes that school facilities and teachers have similar effects on all students, and that the allocation of inputs to students is independent of student characteristics.

However there has been considerable evidence to indicate that students do not receive equal benefits from schools and their teachers. The alternate strategies which at least partially overcome these difficulties are to link teacher and student in the analysis, or to use the teacher as the unit of analysis (for the study of teacher effects). These strategies, however, have been rarely utilized.

^{1/} The use of teachers as the unit of analysis is virtually unknown in teacher effect studies. Yet the advantage of this strategy should be obvious, since the aggregation of teacher variables (a normal procedure in EPF studies) masks rather than reveals the importance of teacher characteristics. A useful example of this alternate strategy is found in Veldman and Brophy's (1974) study of primary school teachers in a Southwestern U.S.A. school. They report a positive relationship between teacher quality and student achievement.

(11) Substantive characteristics of populations in LDCs which have methodological implications

Closely linked with the technical aspects of research methodologies often employed in research into the determinants of student achievement are a number of substantive considerations. It is generally known that the outcomes of regression analysis are contingent to a large extent on the nature of the variables entered into the regression. The fact that teacher and school variables have not accounted for much variance in achievement outcomes in LDC studies is possibly due to little variation in these variables. Thus it appears that once a certain threshold level of school facilities and teacher quality has been reached, little additional effect on achievement can be obtained by the manipulation of these variables (Alexander and Simmons, 1975; Caillods, et al., 1975; Schiefelbein, 1975; Heyneman, 1976a).

However, in the study of LDC schools there is reason to believe that the variation in school resources, and in particular teacher competence, is much greater than in developed industrialized countries. Although little attention is generally given to these differences in most reports (except perhaps ex post facto), international studies of educational achievement have documented these differences at an international level (Coleman, 1975; Platt 1975). Thus any differences either in achievement, and certainly in the relative importance of its determinants such as school resources or teacher competencies, may be a function of wider variations between schools (or regions) of these variables. With this in mind, the following observations are useful in the estimation of teacher effects from LDC achievement studies.

1. The variation of socio-economic background of students in many LDCs is greatly attenuated, with the result that background appears to contribute little in explaining variance in achievement (Heyneman, 1976a). Compared with developed countries, where there is considerable heterogeneity in material conditions, life-styles, and occupational status, the background conditions of LDCs is relatively homogeneous. 2/

2. Concomitant with the above, there is often in most LDCs a wider variation in teacher related variables than is found in developed industrialized countries, thus making it statistically possible to find a stronger teacher effects in the LDCs. The fact that this has not sometimes been the case (see, for example, Heyneman, 1976b) lends even greater support for the unimportance of these variables in explaining variance in student achievement.

2/ An example of this situation can be found in the recent Botswana survey, which showed that 50.3 percent of the Form III students came from agricultural backgrounds, and that 71.9 percent of the fathers owned cattle (Husen, 1977, Pop. II, 1976). Heyneman (1976a) describes his efforts to maximize background variation in his Uganda study in order to more accurately measure their effects on achievement outcomes.

3. Studies in industrialized countries have shown that school and teacher resources have differential effect on students of varying abilities and backgrounds: the more disadvantaged the students, the greater effect of school and teacher variables. Insofar as there is a large proportion of students in LDCs from deprived backgrounds, one would expect that resource variables would have greater impact on achievement than studies in industrialized countries would tend to suggest.

In addition to the previous methodological considerations, there are a number of specific problems concerned with the use of survey data and highly sophisticated multiple regression procedures which may tend to underestimate teacher effects. These are briefly summarized below.

(i) Assumptions underlying the use of survey data and the EPF in studies of achievement in LDCs

1. In order to infer causality from cross-sectional data (i.e. survey data), it is necessary to assume that some variables precede others in time, and that present levels of a variable are reliable indicators of past levels (for example, student background variables, which may or may not be cumulative over time).

However, this assumption is incongruent with the fact that students may encounter many teachers during their academic careers, and that the mobility between schools of teachers and students introduces error into the input variable measurements. The possibility of significant relationships between input and output variables is reduced. ^{3/}

2. In previous analyses of the factors relating to student achievement, researchers have generally assumed that the learning process is a constant, and thus have generated a single explanatory equation to describe the relationships between input and output variables.

However, as already established in this report (IIA), this assumption is incongruent with considerable evidence from anthropologists and psychologists. It has furthermore been questioned by other evaluators of the research literature (Averch, et al., 1972), as well as persuasive argumentation based on conditions in LDCs (Schiefelbein, 1975).

(ii) Assumptions underlying multiple regression and variance explained strategies

In a recent survey of research on student achievement in LDCs (Alexander and Simmons, 1975), attention is limited to EPF studies using multiple regression techniques. Not only have most of the larger and more

^{3/} The turnover of teachers in LDC schools has been frequently mentioned. See, for example, Watson-Franke (1974) and Schiefelbein (1975).

sophisticated studies utilized these techniques, but these statistical strategies have generally been considered more valid and productive than other known types of strategies. With this in mind, the following observations are presented as useful guidelines in assessing these types of studies, especially when the analysis of determinants of student outcomes produce small or insignificant results. ^{4/}

1. If only a few variables are used in the student achievement models, the amount of total variance explained will be small.

2. If the model used in the analysis is misspecified, and the independent variables in the equation are unimportant, then obviously the total amount of variance explained will be small or insignificant.

3. If there is considerable multi-collinearity among the variables which are presumed to explain achievement differences, then the total amount of variance explained will be small or insignificant.

4. Likewise, if there is considerable measurement error in the variables in the model, the total amount of variance explained will be reduced or underestimated. This observation is particularly important in the assessment of the validity and reliability of achievement measures, as well as attitudes of teachers and students and other aspects of teacher and student behavior.

5. If there is little variance in the variables, then there will be little to explain, even in highly sophisticated models. Thus if the parents of all the students in a particular sample come from similar backgrounds, little of the variance will be explained by this factor. Clearly this is an important consideration when assessing studies of achievement in LDCs.

6. When incremental partitioning of variance is the strategy used, (as has been the case in most achievement studies), and when the variables in the model are intercorrelated (which they usually are), the importance of each variable, or block of variables, is largely determined by the order of entry into the regression equation.

^{4/} A most useful summary of possible explanations for small or insignificant variance explained (R^2) by factors in achievement models, is found in Pedhazur.

APPENDIX BTHE SEARCH STRATEGY

Although the Teacher Training Project officially began in late January, 1977, work was already well in progress in mid-December 1976. An ERIC search was commissioned in late January after a careful selection of over 30 descriptors. This search resulted in the identification of 1463 items related to teacher variables, student achievement, and LDCs. While much of this material related to background or topics of central concern to the project, a number of key articles and reports were identified in this manner.

During this time a systematic bibliographic search was being conducted through other information retrieval sources. In particular searches were conducted in Current Contents, Psychological Abstracts, Sociology of Education Abstracts, and Sociological Abstracts.

From March 16 to March 22, Saha visited the International Institute for Educational Planning (IIEP) in Paris, not only to utilize their library facilities in educational planning and development, but also to consult with members of the staff.

From May 9 to May 20 a second project mission was made. Included were searches of the library holdings of the International Bureau of Education (IBE) and the International Labor Organization (ILO) in Geneva. A second visit to IIEP in Paris permitted the completion of the search, which began earlier. The search also included the resources of the Institute of Education at the University of London and the Institute of Development Studies (IDS) at the University of Sussex. At all these institutions, interviews were held with key personnel, and their libraries and other resources were utilized in order to locate additional materials which might be relevant to the topic of the project.

From February to June, three work-in progress seminars were given at the Institute for International Education, Stockholm: February 24, April 14, and June 7. Many of the ideas relevant to this report were articulated and debated by members of the Institute staff, whose contributions must be acknowledged.

During the remainder of June, and throughout July and August, the results of the search were organized, thoroughly examined and written up, terminating in the present report.

BIBLIOGRAPHY

A. Studies Concerned With Teacher Characteristics and Achievement in Less Developed Countries

BEEBOUT, Harold Seymour, The Production Surface for Academic Achievement: An Economic Study of Malaysian Schools. Ph.D. Thesis, University of Wisconsin, 1972.

BIBBY, John and Margaret PEIL, "Secondary Education in Ghana: Private Enterprise and Social Selection", Sociology of Education, 47 (Summer 1974): 399-418.

CARNOY, Martin, "Family Background, School Inputs and Student's Performance in School: The Case of Puerto Rico", Stanford University, School of Education, 1971.

_____, "A Systems Approach to Evaluating Education, Illustrated with Puerto Rican Data", Stanford School of Education, 1971a.

CARROLL, J.B., The Teaching of French as a Foreign Language in Eight Countries, Stockholm: Almqvist & Wiksell, 1975.

COMBER, L.C., and John P. KEEVES, Science Education in Nineteen Countries, Stockholm: Almqvist & Wiksell, 1973.

CURRIE, Janice, "Family Background, Academic Achievement and Occupational Status in Uganda", Comparative Education Review, 21 (February 1977): 14-28.

DUROJAIYE, M.O.A., "The Role of Non-Cognitive Factors in School Learning of Uganda Secondary School Pupils", West African Journal of Educational and Vocational Measurement, 2 (1) (December 1974): 35-39..

ELLSON, Douglas G., Programmed Teaching: Effective Teaching by "Unqualified Teachers", Innotech: Regional Center for Regional Innovation and Technology, June 1973.

FARRELL, J.P., and E. SCHIEFELBEIN, "Expanding the Scope of Educational Planning: The Experience of Chile", Interchange, 5 (1974): 18-30.

FULLER, William P., and Amrung CHANTAVANICH, A Study of Primary Schooling in Thailand: The Final Report: Factors Affecting Scholastic Achievement of the Primary School Pupils. Thailand: Office of the National Education Commission, 1976.

BIBLIOGRAPHY (Continued)

HEYNEMAN, Stephen P., "Influences on Academic Achievement: A Comparison of Results from Uganda and More Industrialized Societies", Sociology of Education 49 (July 1976a): 200-211.

_____, "Relations Between Teachers' Characteristics and Differences in Academic Achievement Among Ugandan Primary Schools", Education in Eastern Africa, 6 (1976b): 41-51.

HORNIK, Robert C., et al., Television and Educational Reform in El Salvador: Final Report, Stanford University: Institute for Communication Research, 1973.

HORNIK, Robert C., "Television, Background Characteristics and Learning in El Salvador's Educational Reform", Instructional Science, 4 (1975): 293-302.

HUSEN, Torsten, "Pupils, Teachers and Schools in Botswana -- A National Evaluative Survey of the Primary and Secondary Education", Annex A of Education for Kagisono. Report of the National Commission on Education in Botswana, Gaborone: Government Printing Office, 1977.

IZQUIERDO, Por Carlos Minoz, and Jose Teodulo GUZMAN, "Una exploracion de los factores determinantes del edimento escolar en la educacion primaria" (An exploration of the determining factors of school output in primary education). Revista del Centro de Estudios Educativos, 1 (2) (April 1971): 7-27.

KLEES, Stephen J., "Television and Other Determinants of Scholastic Achievement in Mexican Secondary Education". Paper prepared for the American Education Research Association Conference. Stanford University: Institute for Communication Research, April 1974.

LEWIS, E. Glyn, and Carolyn E. MASSAD, The Teaching of English as a Foreign Language in Ten Countries. Stockholm: Almqvist & Wiksell, 1975.

LEVY, Mildred B., "Determinants of Primary School Dropouts in Developing Countries", Comparative Education Review, XV (1) (February 1971): 44-58.

NASOETION, N., A. DJALIL, I. MUSA, and S. SOELISTYO, The Development of Education Evaluation Models in Indonesia, Paris: International Institute for Educational Planning, (UNESCO), 1976.

BIBLIOGRAPHY (Continued)

- OKUNROTIFA, P.O., "A Pilot Study of Nigerian Pupils' Attitude Toward and Achievement in a Programmed Unit of Geography", Journal of Negro Education, 44 (4) (1975): 538-546.
- PHILIPPINES DEPARTMENT OF EDUCATION AND CULTURE, Survey of Outcomes of Elementary Education, Makati, Rizal Philippines, May 1976.
- PURVES, Alan C., Literature Education in Ten Countries. Stockholm: Almqvist & Wiksell, 1973.
- ROWE, Elizabeth, Y.P. LAU, G.H. LEE, A.K. LI, and W.G. RODD, Failure in School: Aspects of the Problem in Hong Kong. Hong Kong University Press, 1966.
- RYAN, John, Educational Resources and Scholastic Outcomes: A Study of Rural Primary Schooling in Iran. Stanford University, PhD. Thesis, 1972.
- SCHMELKES, Sylvia, "Estudio de Evaluacion Aproximitiva de las Escuelas Radiofonicas de la Tarahumara (Mexico)", Revista del Centro de Estudios Educativos, 2 (1972): 11-36.
- SHUKLA, Snehlata, "Achievements of Indian Children in Mother Tongue (Hindi) and Science", Comparative Education Review, (June 1974): 237-247.
- SILVEY, Jonathan, "Long-Range Prediction of Educability and Its Determinants in East Africa", in L.J. Cronback and P.J.D. Drenth, (eds), Mental Tests and Cultural Deprivation, Paris: Mouton Publishers, 1972.
- SOMERSET, H.C.A., Predicting Success in School Certificate: A Uganda Case Study. Nairobi: East Africa Publishing House, 1968.
- THIAS, Hans Heinrich and Martin CARNOY, Cost-Benefit Analysis in Education: A Case Study of Kenya. Washington, D.C., International Bank for Reconstruction and Development, 1972.
- THORNDIKE, Robert L., Reading Comprehension Education in Fifteen Countries. Stockholm: Almqvist & Wiksell, 1973.
- WILLIAMS, T. David, "Wastage Rates and Teaching Quality in Guatemala Primary Schools", Comparative Education Review, 11 (February 1965): 46-53.

BIBLIOGRAPHY (Continued)

WINDHAM, Gerald O., "Occupational Aspirations of Secondary School Students in Sierra Leone", Rural Sociology, 35 (1) (1970): 40-53.

YOUDE, Robert V., An Exploratory Study of Achievement and Attitudes of High School Students in the Congo: An Aspect of Socialization for National Development. Ph.D. Thesis, Stanford University, 1972.

BIBLIOGRAPHY (Continued)

B. General Bibliography

- AKINPELU, J.A., "The Educative Processes in Non-Literate Societies: An Essay in the Anthropological Foundations of Education", West African Journal of Education (1974): 413-422.
- ALEXANDER, Leigh, and John SIMMONS, The Determinants of School Achievement in Developing Countries: The Educational Production Function, International Bank for Reconstruction and Development, Staff Working Paper 201, March 1975.
- AVERCH, Harvey A., Stephen CARROLL, Theodore S. DONALDSON, Herbert J. KIESLING, and John PINCUS, How Effective is Schooling? A Critical Review and Synthesis of Research Findings, Santa Monica, Calif.: Rand Corp., 1972.
- AYABE, Tsuneo (ed), Education and Culture in a Thai Rural Village, The Research Institute of Comparative Education and Culture, Faculty of Education, Kyushu University, Fukuoka, Japan, February 1973.
- BOWLES, Samuel, and Henry M. LEVINE, "The Determinants of Scholastic Achievement - An Appraisal of Some Recent Evidence", Journal of Human Resources, 3 (Winter 1968): 3-24.
- _____, "More on Multicollinearity and the Effectiveness of Schools", Journal of Human Resources, 3 (Summer 1968): 393-400.
- BROWN, Daniel J., "Down with the Linear Model", American Educational Research Journal, 12 (Fall 1975): 491-505.
- CAIN, Glen G., and Harold W. WATTS, "Problems in Making Policy Inferences from the Coleman Report", American Sociological Review, 35 (April 1970): 228-242.
- CARNOY, Martin, and Henry LEVIN, "Evaluation of Educational Media: Some Issues", Instructional Science, 4 (1975): 385-406.
- CHARTERS, W.W., "The Social Background of Teaching", in N. Gage (ed), Handbook of Research on Teaching, Rand McNally & Co.: Chicago, 1963: 715-813.

BIBLIOGRAPHY (Continued)

- CHOPRA, S.L., "Parental Occupation and Academic Achievement of High School Students in India", Journal of Educational Research, 60 (1966-1967): 359-362.
- CALLIODS, F., G. CARRON and C. TA NGOC, "Research Project on Regional Disparities in Educational Development", Paris: IIEP/UNESCO, 1975 (mimeo).
- COLE, Michael and Jerome S. Bruner, "Cultural Differences and Inferences about Psychological Processes", in Martin L. Maehr and William M. Stallings (eds), Culture, Child and School, Monterey, Cal.: Brooks/Cole Publishing Company, 1975.
- COLEMAN, James S., et al., Equality of Educational Opportunity. Washington, D.C.: U.S. Government Printing Office, 1966.
- COLEMAN, James S., "The Children Have Outgrown the Schools", Psychology Today, 5 (9) (February 1972): 72.
- _____, "Methods and Results in the IEA Studies of Effects of School and Learning", Review of Educational Research, 45 (3) (Summer 1975): 335-386.
- CURRIE, Janice, "Stratification in Uganda: Schooling and Elite Recruitment", Greylands Educational News, 9 (July 1974): 26-42.
- DRYSDALE, Robert S., "Factores Determinantes de la Desercion Escolar en Columbia", Revista del Centro de Estudios Educativos, II (1972): 11-36.
- DUNKIN, Michael J., and Bruce J. BIDDLE, The Study of Teaching, New York: Holt, Rinehard and Winston, Inc., 1974.
- EPSTEIN, Erwin H., "Parasitic diseases and academic performance of school children", Social and Economic Studies, 23 (4) (1974): 551-570.
- FAHRMEIER, Edward D., "The Effect of School Attendance on Intellectual Development in Northern Nigeria", Child Development, 46 (1) (1975): 281-285.
- GARCIA, Carmen, Eduardo CASTENADA, Lilian de Leon, and Ernesto SCHIEFELBEIN, "Television y Redimento Escolar en Venezuela" (Television and School Outputs in Venezuela), Revista del Centro de Estudios Educativos, IV (1) (1974): 43-52.

BIBLIOGRAPHY (Continued)

- GAY, John and Michael COLE, The New Mathematics and an Old Culture: A Study of Learning Among the Kpelle of Liberia. New York: Holt, Rinehard and Winston, Inc., 1967.
- GETZELS, J.W., and P.W. JACKSON, "The Teacher's Personality and Characteristics", in N. Gage (ed), Handbook of Research on Teaching. Chicago: Rand McNally & Company, 1963.
- GLADWIN, Thomas, East is a Big Bird: Navigation and Logic on Puluwat Atoll. Cambridge: Harvard University Press, 1970.
- GUTHRIE, James W., "A Survey of School Effectiveness Studies", in Do Teachers Make a Difference? Washington, D.C.: Department of Health, Education and Welfare, 1970.
- HANUSHEK, Eric A., and John F. KAIN, "On the Value of Equality of Educational Opportunity as a guide to public policy", in Frederik Mosteller and Daniel P. Moynihan (eds), On Equality of Educational Opportunity. New York: Random House, 1972.
- HEYNEMAN, Stephen P., "Why Impoverished Children do Well in Ugandan Schools: The Difference Between Economic Privilege and Social Class": Mimeo (no date).
- HUSÉN, Torsten (ed), International Study of Achievement in Mathematics: A Comparison of Twelve Countries (Vols. I and II). Stockholm: Almqvist & Wiksell, 1967.
- HUSÉN, T., "Patterns and Structures for Teacher Education in Developing Countries". Invited Lecture at the London University Institute of Education, November, 1977.
- INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT, Education: Sector Working Paper. Washington: 1974.
- JENCKS, Christopher S., and Marsha D. Brown, "Effects of High Schools on their Students", Harvard Educational Review, 45 (3) (August 1975): 273-324.
- JENCKS, Christopher, et al., Inequality: A Reassessment of the Effect of Family and Schooling in America. New York: Basic Books, Inc., 1972.

BIBLIOGRAPHY (Continued)

- KIROS, Fassil G., Selma J. MUSHKIN, and Bradley B. BILLINGS, Educational Outcome Measurement in Developing Countries. Washington, D.C.: Public Services Laboratory, 1975.
- LAVIN, David E., The Prediction of Academic Performance. New York: Russell Sage Foundation, 1965.
- LEACOCK, Eleanor Burke, Primary Schooling in Zambia: Final Report. Brooklyn Polytechnic Institute, 1972.
- LUECKE, Daniel F., and Noel F. MCGINN, "Regression Analyses and Educational Production Functions: Can They be Trusted?", Harvard Educational Review, 45 (3) (August 1975): 325-350.
- LYNCH, Patrick D., "School and Family Predictors of Achievement: and Dropout in Elementary Schools of a Developing Country", American Education Research Association Conference, Washington, D.C., 1975.
- MAYO, Judith A., Teacher Observation in El Salvador, Washington, D.C.: Information Center on Instructional Technology, Academy for Social Development, 1971.
- _____, Teacher Observation in Mexico. Washington, D.C.: Information Center on Instructional Technology, Academy for Social Development, 1973.
- MMARI, G.R.V., "Attempts to Link School with Work: The Tanzanian Experience", Prospects, Vol VII(3) (1977): 379-388.
- MORRISON, A., and D. McINTYRE, Teachers and Teaching. Penguin Books, Harmondworth, 1969.
- NDUKA, O. "African Traditional Systems of Thought and Their Implications for Nigerian Education". West African Journal of Education, Vol. XVIIIi (2) (June 1974): 153-164.
- NOLLEN, Stanley D., "The Economics of Education: Research Results and Needs", Teacher's College Record, 77 (1), (September 1975): 51-77.
- PEDHAZUR, Elazar J., "Analytic Methods in Studies of Educational Effects", in Fred N. Kerlinger (ed), Review of Research in Education: 3, Itasca, Ill.,: F.E. Peacock Publishing Co., 1975.
- PLATT, William J., "Policy-Making and International Studies in Educational Evaluation", in Alan C. Purves and Daniel U. Levine (eds), Educational Policy and International Assessment. Berkeley: McCutchan Publishing Corporation, 1975.

BIBLIOGRAPHY (Continued)

- ROENSHINE, Barak, Teaching Behaviors and Student Achievement.
London: National Foundation of Educational Research, 1971.
- SCHIEFELBEIN, Ernesto, "The Impact of Input-Output Educational
Research on Developing Countries", in John Simmons (ed),
Investment in Education: National Strategy Options for
Developing Countries. IBRD Working Paper 196, February, 1975.
- SIMMONS, John, Towards an Evaluation of Literacy and Adult
Education for Development: The Tunisian Experience.
USAID/Tunis and UNESCO/Paris, April 1972.
- _____, Towards an Evaluation of Literacy and Adult
Education in a Developing Country: A Pilot Study.
Department of Economics and Graduate School of Education,
Harvard University, September 1970.
- _____, "Education, Poverty and Development", in
John Simmons (ed), Investment in Education: National
Strategy Options for Developing Countries. IBRD Working
Paper No. 196, February 1975.
- SHARP, Donald W., and Michael COLE, The Influence of Educational
Experience on the Development of Cognitive Skills as Measured
in Formal Tests and Experiments: A Case Study from the Mexican
States of Yucatan and Quintana Roo: Final Report. New York:
Department of Health, Education and Welfare, 1974.
- STUDSTILL, John D., "Why Students Fail in Masomo, Zaire", Journal
of Research and Development in Education, 9 (4) (Summer 1976):
124-137.
- VELDMAN, Donald J., and Jere BROPHY, "Measuring Teacher Effects
on Pupil Achievement", Journal of Educational Psychology,
66 (3) (1974): 319-324.
- WATSON-FRANK, Maria-Barbara, "Traditional Educational Concepts
in the Modern World: the Case of the Guajiro Indians of
Venezuela", Sociologus, 24 (2) (1974): 97-116.
- WEIGHTMAN, George, and Zahi RIHANI, "Social Stratification and
Adolescent Achievement in a Lebanese Town", Comparative
Education Review (June 1967): 208-216.

PART II

AN EMPIRICAL STUDY OF TWO COUNTRIES: CHILE AND INDIA

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SUMMARY

The purpose of the present study was to investigate the effect of teacher training on student science achievement in developing countries. The data used were collected by the International Association for the Evaluation of Educational Achievement (IEA) in their 1970 survey. The countries involved in the present study were Chile and India.

The IEA data files contain a large number of items. Previous analyses, however, have used only a very small proportion of them. Attempts to analyze large school survey data sets in the late 1960's and early 1970's showed that a new paradigm was needed for thinking about and analyzing school and teacher effects on student outcomes of schooling. First, there was a need for methods for reducing the mass of data available to a small set of parsimonious descriptions of the relevant underlying phenomena. Second, there was a need for a causal conceptualization of the educational situation in models elaborate enough to cover all major relevant aspects of schooling. Third, there was a need for methods suitable for testing these models. Statistical developments in the 1970's have made great progress toward meeting these needs. A key development is the use of path modelling with latent variables, a technique used in the present study.

In investigating the effects of teacher training on student achievement, it was necessary to control for other relevant variables. This was done with the help of a model of the schooling situation, which covered, within the limits of the IEA data bank, as wide a scope as possible. The analytical methods used enabled the calculation of both the direct effect of formal teacher training, holding all other relevant variables constant, and the indirect effect, through other variables that teacher training influences. In addition, it was possible to calculate rough estimates of the potential effect of any form of teacher training.

The analysis showed similar results in Chile and India. Verbal IQ, of course, showed by far the strongest total effect on student achievement. The next strongest effect was shown by Teaching Methods. Teacher Training showed slightly stronger effects than Home Background. Sex of Student and Sex of Teacher had negative effects, with girls having lower achievement levels than boys and women teachers being associated with lower achievement levels among students than men teachers. Region and School Atmosphere had essentially no effect. The effects of other variables were inconsistent.

The results of the analysis suggest that if the mean level of formal teacher training in the respective countries were raised to the level of the most highly trained 50 percent of teachers today, mean student science achievement, as measured by the IEA test score, would rise from 9.6 to 10.3 in Chile and from 8.3 to 8.7 in India. These increases represent 8 and 5 percent of a standard deviation in achievement in the respective countries. These estimates are based on the assumption that increases in the level of teacher training would occur within the framework of the formal teacher training programs through which the sampled teachers had gone.

It might be argued, however, that the Teacher Training variable was too conservative a measure of the potential teacher effect, since it measured traditional formal teacher training. What is more important is not teacher training as such but the behaviors teachers manifest in the classroom. There are many ways that teacher behaviors can be changed, and formal training of young teacher candidates is only one way. Moreover, even other teacher variables, such as sex and experience, are really surrogates for teacher classroom behavior measures, since behaviors are not rigidly bound to sex or experience. Women teachers can, in principle, learn those behaviors which their male colleagues exhibit which account for the observed effects of teacher sex. From that point of view, an estimate of the potential effects of all forms of teacher training would be the combined effects of all teacher background and training variables, teaching methods, and a residual "Opportunity to Learn" variable. Approximate calculations of this aggregate teacher effect suggest that if aggregate teacher effectiveness were raised so that the mean teacher effectiveness were as high as the mean of today's most effective 50 percent of all teachers, student science achievement would rise from 9.6 to 11.0 in Chile and from 8.3 to 9.6 in India. These increases correspond to 16 and 15 percent of a standard deviation in achievement in the respective countries. The aggregate effect of school variables was approximately the same as the aggregate teacher effects.

The estimates of teacher effects on student science achievement calculated in the present study do not provide evidence on what economic rate of return countries might gain on investments in teacher training programs. That depends on a variety of pedagogical and economic considerations. What they do suggest, however, is that if investments are made in teacher training programs, there will be a return on the investment in terms of increases in the level of student cognitive outcomes of schooling.

INTRODUCTION

The present study is based on a reanalysis of the data collected by the International Association for the Evaluation of Educational Achievement (IEA) in their 1970 Science survey (Comber and Keeves, 1973). The analysis reported there consisted of stepwise multiple regression with fixed order of entry of blocks. There were four blocks, representing Home and Student Background, Type of School or Course, Learning Conditions in the School, and Kindred Variables. The analogical model on which the analysis was based is reported in detail in a technical report (Peaker, 1975). Neither the model nor the statistical methods used was adequate to enable a consideration of such specific questions as the effect of teacher training on student achievement. In the present study a more elaborate model is presented and more advanced statistical methods are employed. In the main part of the report the technical details are kept to a minimum. For a more thorough discussion of the technical aspects of the study the reader is referred to Annex B.

THE SAMPLES

In the IEA Studies, stratified probability samples of schools were drawn, and random samples of approximately 25 students were drawn in each of the selected schools. All teachers teaching science in the sampled schools were surveyed. Three populations were sampled. Loosely defined, these were the 10-year-old age group, the 14-year-old age group, and students in the terminal secondary school grade. In the present study, the 14-year-old age group, Population II, was analyzed. This decision was conditioned by the fact that at the 10-year-old age level, science is usually not taught as a separated and distinct subject. Teachers at that level are not expected to have specialized competence in science. At the terminal secondary grade level, however, the population consists of a very selected group of students, since most children in the relevant age groups had left school earlier. Also, students at that age have a wide range of specializations within science and among other fields. Subsampling science specialists from the total IEA sample, which would probably be necessary for a study of this kind, would seriously reduce the case base. The advantages with Population II are that relatively large proportions of children in the relevant ages are still in school and that all students are intended to acquire some degree of mastery of the unspecialized body of knowledge taught at that level.

Population definitions varied from country. The major differences concerned the definitions of the excluded populations. The design target population in Chile included students aged 14:00 - 14:11 who were in primary or secondary school above the fourth grade. Excluded were students in grades 1 - 4 (18.6 percent of the age group who were in school) plus 42.7 percent of the age group who were not in school. The design target population in India included students aged 14:00 - 14:11 who were above the fifth grade. Excluded were students in private institutions, schools where the medium of instruction was other than Hindi, schools for the physically handicapped, and vocational schools.

Geographically, the Chilean sample was nationally representative. The Indian sample, however, was restricted to the Hindi-speaking region, consisting of the states of Uttar Pradesh, Bihar, Madhya Pradesh, Rajasthan, Haryana, and the Union Territory of Delhi. Approximately 41 percent of the total population of the country resides in this area.

The actual target population did not completely correspond to the design target population, as can be observed from the characteristics of the samples shown in Tables 1 and 2. The original files contain somewhat larger numbers of cases, but for the present study the files were edited by excluding students who, on the basis of test scores, could be defined as illiterate and thus probably unable to properly fill in the questionnaires. The definition of illiterate was generous, and a student had to have at least three test scores (Word Knowledge, Science, Reading Comprehension, or, in Chile, Literature) of less than or equal to zero in order to be removed from the sample. In addition, students not having a score for science were removed. Altogether 109 students were removed from the Chilean sample, and 225 were removed from the Indian sample.

Table 1: FREQUENCY DISTRIBUTION FOR AGE IN THE EDITED SAMPLES

Country	Age in Months										MD
	-161	162- 164	165- 167	168- 170	171- 173	174- 176	177- 179	180- 182	183- 185	186+	
Chile	0	1	0	347	249	253	226	97	0	0	77
India	453	127	67	465	405	434	267	249	82	129	82

Table 2: FREQUENCY DISTRIBUTION FOR GRADE IN THE EDITED SAMPLES

Country	Grade										MD*
	3	4	5	6	7	8	9	10	11	12	
Chile	2	16	121	183	165	356	283	53	1	1	69
India	5	10	21	355	737	1002	357	166	38	1	68

Note: * Missing data.

The total numbers of students, teachers, and schools included in the edited samples appear in Table 3. The figures shown for schools represent the actual number of schools in the sample. For the teachers, however, the figures represent only an approximation. Due to the aggregation process used in constructing the original between-student files, the exact number of teachers represented in the files is unknown.

Table 3: STUDENTS, TEACHERS AND SCHOOLS IN THE EDITED SAMPLES

Country	Students	Teachers	Schools
Chile	1250	302	147
India	2760	151	156

The student was the unit of analysis for the present study. With each student was associated responses to the school questionnaire as well as the school mean response for all teachers in the school. That is, individual students cannot be associated with individual teachers but with an aggregated "school mean" teacher. It should be noted that it has never been possible, at any stage in the construction and processing of the IEA data files, to link individual students and teachers. This, in turn, introduces a source of measurement error into the analysis, which leads to an underestimate of the effect of teachers on student achievement.

THE STATISTICAL METHODS

From Analogical Models to Causal Path

Models with Latent Variables

In the international report of the IEA Science study, the analysis was based on an analogical model "corresponding to stages in the life of a student, who before he comes under survey has been conceived, born, brought up by his parents in a certain neighborhood, and undergoes early school education" (Comber and Keeves, 1973, pp. 189-190). In accordance with this model, the variables entered into the analysis were divided into four blocks, corresponding to the Home and Student Background, Type of School or Program, Learning Conditions in the School, and so-called "Kindred Variables". The blocks were entered in the given order into a multiple regression, and the increment in R^2 as each block was entered was taken as a measure of the "contribution" of the respective block. Such a procedure, however, is inevitably asymmetrical when the blocks are correlated (Coleman, 1975). This is very often the case in school survey research, where home and school circumstances are usually correlated (Noonan, 1976). Moreover, as Duncan (1975, p. 65) points out, partitioning of R^2 into parts attributed to different blocks "bears no essential relationship to estimating or testing a model, and it really does not add anything to our understanding of how a model works." Finally, a four-block model is too coarse for a study of specific educational problems, such as the effects of teacher training on educational achievement.

Under the circumstances, it is clear that a new paradigm was needed for thinking about school effects and for analyzing school survey data. First, there was a need for methods for reducing the mass of data available to a small set of parsimonious descriptions of the relevant underlying phenomena. Second, there was a need for a causal conceptualization of the educational situation in models elaborate enough to cover all major relevant aspects of schooling. Third, there was a need for methods suitable for testing these models.

In school survey research there are two key lines of development which move toward meeting the needs discussed above. The first of these is the use of path modelling, developed in biology in the late 1920's and early 1930's (Wright, 1934) and beginning to appear in the school survey literature in the late 1960's. The second is the use of latent variables, introduced in sociology in the 1950's (Lazarsfeld, 1959) and beginning to appear in school survey research in the early 1970's. A seminar paper based on ad hoc procedures but traceable to these two traditions appeared first at an IEA seminar and was later published (Coleman, 1975). More formal methods have also been developed, involving both ordinary least squares (Wold, 1973; 1976) and maximum-likelihood (Joreskog, 1973, 1976) regression procedures. These two methods have provided the necessary formalization of simultaneous data reduction procedures and estimation procedures within a framework of causal

path modelling. The ordinary least squares methods, NIPALS (Nonlinear Iterative Partial Least Squares), appear to be especially suited to the kind of macro models used in school survey research. Examples of the application of NIPALS methods to school survey data have been published (Noonan, 1977; Noonan and Wold, 1977).

These methods, by requiring the explicit specification of the latent variables, invite the formation of variables which are both conceptually and empirically satisfying. At the same time the analysis procedures, by requiring the explicit specification of a model, invite the development of a model that can be meaningfully interpreted in terms of educational theory. The result is the needed theoretically meaningful parameters relating the explicitly specified measures of the relevant underlying phenomena. The parameters used to assess the influence of the respective underlying phenomena are thus not increments in R^2 but standardized partial regression coefficients, or beta weights, which have exactly the same interpretation as in classical regression analysis.

NIPALS Path Modelling With Latent Variables

In attempting to analyze school survey data, one of the basic problems with which the researcher is faced is how to estimate the dependence of a criterion, Y , on a set of explanatory variables, X_j , which are correlated among themselves. In practice, one aspect of this problem is that generally the X_j 's cannot be measured directly by a single questionnaire item. Instead they are measured by combinations of questionnaire items, x_{jk} . The underlying unobservables, X_j , are referred to below as latent variables^{jk} when they are specified as linear combinations of observables, x_{jk} , which are referred to as manifest variables.

For example, in an analysis of the effects of teacher training on student achievement, it is necessary for student's home background and other relevant variables to appear in the model in order to provide unbiased estimates of the independent effects of teacher training, ceteris paribus. There is, however, no single item on any questionnaire which is adequate to represent the several dimensions of student home background. Instead there are from the IEA questionnaire for Chile twelve items directed at different aspects of the home background, as shown in Table 4. Using NIPALS methods, these items constitute twelve manifest variables. These variables are first standardized to zero mean and unit variance. Subsequently, latent variables are specified as linear compounds of the standardized manifest variables. These linear compounds, or weighted means of questionnaire items, are taken as more accurate measures of given dimensions of the home than any single item would be. Some variables, however, can be measured adequately by a single variable, such as Verbal IQ or Science Score. Although both are really compounds of items on tests, we will not distinguish between manifest and latent variable in such cases.

Table 4: MANIFEST VARIABLES REPRESENTING STUDENT HOME BACKGROUND IN CHILE

Variable Number	Short Name	Long Name
112	FOCC	Father's Occupation
116	FED	Father's Education in Years
117	MED	Mother's Education in Years
125	Q62G49	Parents Insist on Correct Speech
126	Q62G50	Parents Check Spelling
127	Q62G51	Use of Dictionary at Home
128	Q62G52	Parents Encourage Reading
129	Q62G53	Parents' Interest in School
132	Q62G54	Parents' Encourage Museums and Concerts
133	Q62G55	Number of Books in the Home
733	Q6R04	Magazines Received at Home per Month
751	Q6R22	Newspapers Family Receives Daily

The relationships between the manifest variables and the corresponding latent variable is referred to as an outer relation. There are primarily two ways of constructing latent variables, the first involving correlation or simple regression (Model A), the second involving multiple regression (Model B). At the present state of development of NIPALS methods, it is unclear under what circumstances it is most appropriate to use Model A and under what circumstances it is most appropriate to use Model B. For this reason, both models were tested in each country. The relationships among the latent variables are referred to as inner relations. These outer and inner relations are illustrated in Figure 1. For the purposes of the present report, only the inner relations are of interest. More complete details about the construction of NIPALS latent variables can be found in the Annex B.

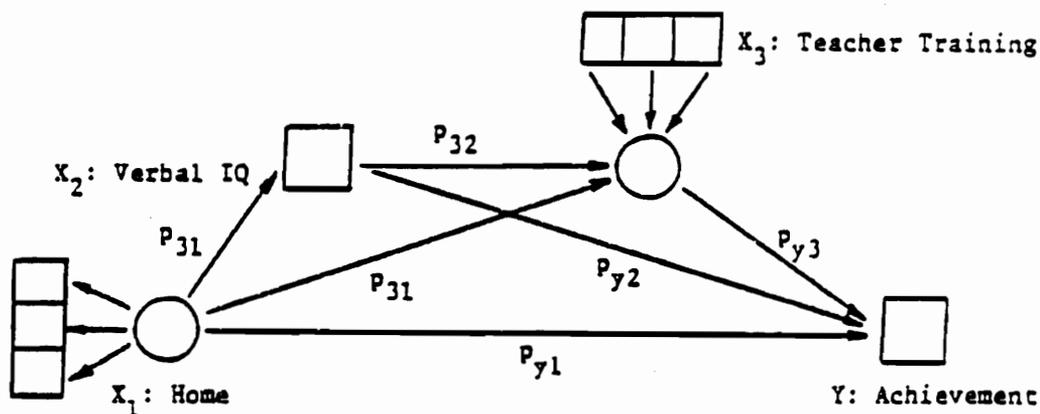


Figure 1: A Simple NIPALS Model with Inward and Outward Indicating Latent Variables

In the analysis for the present report, a relatively simple model was used, although there is every reason for supposing that the use of somewhat more elaborate models and the corresponding estimation procedures would yield improved estimates of the parameters. The limitations at this time are due to the absence of a general NIPALS program capable of efficiently handling large quantities of data, in terms of both numbers of variables and numbers of cases. Such a program is currently under development at the Institute of International Education in Stockholm. In the absence of such a general program, the estimation procedures have taken the form of a large number of separate regression runs on the computer--at least one for each outer relation and one for each inner relation. A general NIPALS program can make better use of the information available in the data by avoiding information loss due to the exigencies deriving from the large amount of handwork involved in a large series of separate computer runs.

A Strategy for Latent Variable Construction

The NIPALS procedure described above is only half of the story behind the construction of the latent variables used in the present study. A general principle underlying the entire analysis is that at each step, the procedure should be based on theoretical considerations and should reflect a sufficiently elaborate conceptual model of the schooling situation. As a result, when the latent variables were constructed, it was regarded as inappropriate to simply aggregate variables without consideration to the dimensionality of the underlying phenomena. Thus there were two major steps in the strategy for the construction of latent variables. In the first step, a factor analytic procedure was used to construct conceptually and empirically distinct and homogeneous compound variables (first-order latent variables) from among the questionnaire items concerning, for example, the home background. These compounds represent the basic unitary dimensions of the respective phenomena. These compounds are in turn combined using NIPALS procedures into measures (higher-order latent variables) representing the multidimensionality of the underlying phenomenon.

Table 5: FACTOR ANALYSIS OVER SOCIOECONOMIC STATUS VARIABLES IN CHILE

<u>Variable</u>	<u>Factor Loading</u>
Father's Occupation	.72
Father's Education	.84
Mother's Education	.80
Number of Books in the Home	.67

This process can be illustrated by reference to the manifest variables for Chile shown in Table 4. Although those variables all represent characteristics of the home, they are by no means conceptually homogeneous. At least three variables--Father's Occupation, Father's Education, and Mother's Education--concern socioeconomic status. A fourth variable--Number of Books in the Home--could conceivably also represent socioeconomic status, since number of books could be a function of family income. The remaining variables clearly represent other aspects of the home, but the underlying dimensionality is unclear. A factor analysis (principal components) over these four variables showed one factor ($\lambda > 1$), but the factor loadings, shown in Table 5, suggest that Number of Books in the Home is something of an outlier empirically, as it is also conceptually. A second factor analysis (principal components with varimax rotation) concerning Number of Books in the Home together with other home background variables, is shown in Table 6.

Table 6: FACTOR ANALYSIS OVER OTHER HOME BACKGROUND VARIABLES IN CHILE

Variable	Factor 1	Factor 2
Parents Insist on Correct Speech	<u>.58</u>	-.15
Parents Check Spelling	<u>.68</u>	-.23
Use of Dictionary at Home	-.35	.47
Parents Encourage Reading	<u>.73</u>	.08
Parents' Interest in School	<u>.61</u>	-.16
Parents Encourage Museums & Concerts	<u>.45</u>	-.36
Number of Books in the Home	-.21	<u>.72</u>
Magazines Received at Home per Month	-.12	<u>.71</u>
Newspapers Family Receives Daily	.01	<u>.71</u>

Two factors emerge, and inspection reveals that the factors correspond conceptually to two different dimensions of the home, namely the behavioral and the material. On the basis of these empirical results and conceptual considerations, four variables emerged: (1) Father's Occupation; (2) Parents' Education; (3) Home Reinforcement and Practices, and (4) Home Material Environment. Home Reinforcement and Practices was computed as the mean of the five items representing parental behavior. Home Material Environment was computed as the mean of the four items concerning material resources in the home. Use of Dictionary was taken on the basis of the factor analysis to represent a material aspect of the home. It would seem that the item really indicated whether or not the family owned a dictionary, an interpretation which is not inconsistent with the wording of the item on the questionnaire. These four variables--Father's Occupation, Parents' Education, Home Reinforcement and Practice, and Home Material Environment--which represent various specific dimensions of the home, were then combined, in accordance with NIPALS principles, into the two higher-order latent variables, AHOME and BHOME, for Models A and B, respectively, which represent the global phenomenon of the Home.

Table 7: HIGHER ORDER LATENT VARIABLES IN THE HYPOTHESIZED CAUSAL AND ASSOCIATIONAL ORDER

	Chile	India	Extended Labels
Exogenous Variables	AREGION, BREGION	REGION	Geographic Region
	AHOME, BHOME	AHOME, BHOME	Student Home Background
	STUSEX	STUSEX	Sex of Student
	VERBALIQ	VERBALIQ	Verbal IQ
	AGE	AGE	Age of Student in Months
Endogenous Variables	GRADE	GRADE	Grade of Student
	HOMWRK	HOMWRK	Student Homework Conditions
	ASCHTYPE, BSCHTYPE	ASCHTYPE	Type of School
	ENROLL	ENROLL	School Enrollment
	AREsourc, BRESOURC	AREsourc, BRESOURC	School Resources
	TEASEX	TEASEX	Sex of Science Teacher
	SCITEEXP	SCITEEXP	Science Teacher Age and Experience
	ATEATRn, BTEATRn	ATEATRn, BTEATRn	Teacher Training
	AMETHODS, BMETHODS	AMETHODS, BMETHODS	Teaching Methods
	SCHATMOS	ASCATMOS, BSCATMOS	School Atmosphere
OPSCI	OPSCI	Student's Opportunity to Learn Science	
Criterion Variable	CSCI	CSCI	Student Corrected Science Score

Using the above strategy, the large number of items in the IEA data files were reduced to a total of 17 latent variables, covering the school science learning situation in as wide a scope as possible within the limits of the IEA data bank. The construction of the latent variables is described in more detail in Annex B, Section 2. The final latent variables used in the analysis are shown in Table 7.

The Teacher Training Latent Variable

Science teachers responded to a total of 14 questionnaire items concerning their educational backgrounds. For some of these the several responses were analyzed separately, so that the total number of manifest variables was somewhat larger. The manifest variables are shown in Table 8. The nationally coded items of course, varied from country to country, depending on the national system of teacher training. The definitions of the different categories in Chile and India are shown in Tables 9 and 10, respectively. The percent of teachers in each category is also reported in Tables 9 and 10.

Table 8: VARIABLES REPRESENTING TEACHER TRAINING

<u>Number</u>	<u>Variable</u>
346	University Degree in Science
347	University Degree in Mother Tongue
348	University Degree in Another Subject
349	No University Degree
352	Years of Education, Primary & Secondary
353	Years of Education, Post-Secondary
384-393	Type of Education - National Codes
395	Semesters Training, Physics
396	Semesters Training, Chemistry
397	Semesters Training, Biology
398	Semesters Training, Geology
399	Semesters Training, Other Science
400	In-Service Training, Physics
401	In-Service Training, Chemistry
402	In-Service Training, Biology
403	In-Service Training, Geology
404	In-Service Training, Other Science

Table 9: TYPE OF TEACHER TRAINING IN CHILE

Category	Definition	Percent
A	No training	1.7
B	Any type of training given by an institution not granting a professional or specialized degree	5.9
C	Some studies in special schools for training of elementary school teachers (non-university "escuela normal")	11.1
D	A degree obtained in the same type of school as in Category C	37.0
E	Some university studies	18.3
F	University degree, but not in subject presently taught	1.1
G	University degree for secondary school teaching in subject presently taught	25.0

Table 10: TYPE OF TEACHER TRAINING IN INDIA

Category	Definition	Percent
A	None after high/higher secondary school	9.6
B	Intermediate or technical school	11.4
C	Training school	10.1
D	Training school offering the "basic education" curriculum	37.6
E	General degree college (up to B.A.: only)	5.8
F	Teacher training college (up to B. Ed. only)	4.8
H	General degree college offering M.A., M.S., and Master of Commerce degrees also	13.8
I	Teacher training college offering M. Ed. degrees also	2.3
J	University	4.5

Some comparisons are useful in order to see the science teachers investigated here in international perspective. Table 11 shows selected characteristics concerning the education and professionalism of science teachers in Chile and India, compared with teachers in the industrialized countries in the IEA survey. None of the indicators available in the IEA data bank reveals anything about the quality of the training teachers have had. Judging from the available qualitative figures, however, it can be seen that, with respect to all indicators, the sampled Chilean teachers were superior to the mean for the industrialized countries. The sampled Indian teachers, however, tended to be very inferior to the teachers in the industrialized countries. This difference between Chilean and Indian teachers should be kept in mind when interpreting the results of the analysis.

Table 11: CHARACTERISTICS OF SCIENCE TEACHERS IN CHILE AND INDIA, COMPARED WITH THE INDUSTRIALIZED COUNTRIES

Variables	Chile	India	Industrialized Countries		
			Mean	Low	High
% University Trained Science Specialists	60	26	56	18	93
Mean Years of Post Secondary Schooling	4.2	2.3	3.7	2.8	4.8
% with 2 Years or Less Post Secondary Schooling	15	53	18	0	58
% with 5 Years or More Post Secondary Schooling	66	21	37	11	85
% Members in Subject Association	62	6	38	13	74
% Read Teaching Journal Regularly	48	17	42	18	66
% Read Science Journal Regularly	64	23	55	29	82

Source: Comber and Keeves, pp. 82-83.

Some of the items in Table 8 are uninteresting in the form in which they appear in the original data files. First, to use all categories of a categorical variable introduces redundancies information. It is often necessary to leave out one category, and it is usually desirable to leave out a reasonably large "base" category, to which all other categories can be meaningfully compared. Variables 346 to 349 are based on a single questionnaire item, each variable being computed as the per cent of science teachers in the school responding to a given alternative--University Degree in Science, University Degree in Mother Tongue, University Degree in Another Subject, No University Degree. In the subsequent analysis, the last category, containing some 50 per cent of the teachers in both countries, was deleted. Second, Variables 395 to 404 were not interesting as separate measures of semesters training and weeks of in-service training in the separate science subjects, since the criterion was the total science score, not specific subtests. Thus these two sets of measures were combined into two variables: (1) TESEMSCI, Total Semesters Science Training, and (2) TEINSSCI, Total Weeks In-Service Training. Factor analysis over the resulting variables led to the construction of first-order latent variables representing different types and levels of teacher training. In Chile, two latent variables were constructed:

(1) Science Teacher Has University Degree, a compound of:

University Degree in Science	(+)
Years of Post-Secondary Education	(+)
Total Semesters Science Training	(+)
Degree in Normal School	(-)
Degree at University	(+)

(2) Science Teacher Has Secondary and In-Service Training, a compound of:

Years of Primary and Secondary Education	(+)
Total Weeks of In-Service Training	(+)
No Training	(-)

In India, two different latent variables were constructed:

(1) Science Teacher Has Masters Degree, a compound of:

University Degree in Science	(+)
Years of Post-Secondary Education	(+)
Total Semesters Science Training	(+)
M.A. or M.S. Degree	(+)

(2) Science Teacher Has Non-Science Degree, a compound of:

University Degree in Mother Tongue	(+)
University Degree in Another Subject	(+)
No Post-Secondary Education	(-)
Teacher Training College	(+)

These latent variables, together with the remaining nationally defined Type of Education variables, were then combined to form NIPALS Model A and Model B higher-order latent variables (ATEATR and BTEATR in Tables 7, 12, 13, and A-1 to A-4).

The Path Model

The variables listed in Table 7 constituted the basis for the analysis presented here. The variables are shown in a causal order. We will refer below to causal relationships and non-causal, man-made associations. The expressions "causal relationships" and "non-causal", "man-made associations" here refer to attributes of a hypothetical model, in particular to the relationship between two or more elements in the model, not to any empirical regularities in the data.

Causal path analysis is based on the assumption that a causal order can be established among the endogenous variables, including the criterion variable. Variables taken to be exogenous need not be causally ordered, and the relationships among them need not be specified as causal or non-causal. Between the exogenous and the endogenous variables there is clearly an ordering. In Table 7, an attempt has been made to establish a general order among all variables, whereby variables may causally influence all variables below them, but they do not causally influence any variables above them. Thus, Region was hypothesized to have a causal effect on Home, Verbal IQ, and the criterion variable, Science Score, to give only a few examples. There may also be a non-causal association with other variables appearing below. Home was hypothesized to have a causal effect on Science Score and a non-causal association with Resources. With 17 variables in the model, there are too many interrelationships to discuss each one within the limited space available. Five variables were considered exogenous, i.e., possible relationships among these variables were ignored. As a result, 126 relationships (parameters) were estimated.

In summary, according to the model tested, each endogenous variable, including the criterion variable, Science Score, was specified as a linear function of all variables appearing above it in the list given in Table 7, plus a residual. Some relations were hypothesized as causal, others as non-causal. Each path analysis thus consisted of 12 regressions, using each variable from Grade to Science Score in turn as the dependent variable and all variables above the respective dependent variables as independent variables or predictors. In both countries, NIPALS Models A and B were tested.

The Parameter Estimates

In the present analysis, an attempt has been made to analyze the causal and non-causal relationships among a wide range of variables hypothesized to play a role in the schooling situation. The state of social and

educational research today is such that measures of broad phenomena generally lack a meaningful scale, even though specific indicators may have such a scale. The number of Books in the Home, Mother's Education in Years, etc., have clear scales, but the quality of the home as a whole, cannot be measured today in such a way as to yield an interpretable, independent scale. Under such circumstances the rationale for the use of concrete or unstandardized regression coefficients--namely, comparability of effects across samples--does not apply. The procedure here was therefore to use standardized regression coefficients as estimates of path effects. Standardized regression coefficients are equal to the unstandardized coefficients times the ratio of the standard deviation of the independent variable to the standard deviation of the dependent variable. The interpretation of a standardized path coefficient, p_{yx} , is as follows: A change of one standard deviation in X is associated with a change of p_{yx} times one standard deviation in Y, holding constant other variables influencing Y. Standardized path coefficients are sample bound. The same natural laws governing a given process might prevail in two different countries, but if the independent variables have different variances in the two countries, the corresponding standardized regression coefficients would be different in the two countries, whereas the unstandardized regression coefficients would be the same. For this reason, the concrete or unstandardized coefficient is regarded as a representation of the true natural laws governing a process (Tukey, 1954; Turner and Stevens, 1959). However, as Wright points out, the use of standardized coefficients has the advantage of enabling a direct and immediate comparison of the relative direct contributions of the several independent variables to variation in the dependent variable (Wright, 1971). In the present analysis, standardized coefficients are used. It is appropriate to compare coefficients within the same sample, therefore, but in trying to interpret differences between countries, it must be remembered that observed differences may be due solely to differences in the variances of the independent variables. Under the assumption that the same underlying natural laws apply in two samples, the standardized regression coefficient will be greater in the sample in which the variance of the independent variable is greater.

The path coefficients (standardized regression coefficients) measure the direct effect of a given independent variable on the dependent variables, ceteris paribus. In the real world, however, other things are rarely constant. Instead, the school situation is characterized by a large network of inter-relationships. This fact, in turn, gives rise to significant indirect effects. Thus for policy purposes, it is important to know not only the direct effects, but also the indirect effects. In the literature there has been some disagreement as to what measure of indirect effect is interesting, but it is generally agreed today that the interesting indirect effects are those operating through causally subsequent variables (Duncan, 1971; 1975). That is, when variables are ordered from causally prior to causally subsequent, the indirect effects are taken to be those which proceed from a given variable and flow through the subsequent variables in the established order. The total correlation between a given explanatory variable and the criterion variable can

thus be disaggregated into a direct component, an indirect component, and a component due to common causation, i.e., through causally prior variables. The direct effect plus the indirect effect, as described above, is referred to below as the total path effect or simply total effect.

THE PATH ANALYSIS

The path analyses were carried out using a backward elimination procedure with an F criterion of 3.84 ($p < .05$ at $df=1$, **) (Kim and Kohout, 1975). The results are shown in Tables A-1 to A-4 in Annex A. These tables show the standardized path (regression) coefficients for all endogenous variables, plus coefficients for the indirect paths and the total path effects for the criterion variable, Science Score. Also shown are the residual coefficients ($\sqrt{1-R^2}$) and the total (zero-order) correlations between the independent variables and the criterion. Standard errors for Chile were typically approximately 0.021 and for India, approximately 0.015. Thus the lowest path coefficient that can appear in Tables A-1 and A-2 is approximately 0.04, and in Tables A-3 and A-4, 0.03. Variables whose coefficients did not exceed these values were removed from the regression, and the table entries for these variables were omitted and treated as zero.

Examining Tables A-1 and A-2, some preliminary observations are in order. First, inasmuch as the samples in both countries cover several grades, it is necessary to enter Grade as a control variable in the analysis. What may be surprising is that Grade is seen to have a negative direct effect, and this requires explanation. The simple correlation between Grade and Science Score is positive, which is to say that students in higher grades tended to have higher science achievement than students in lower grades. Grade, however, even at this age level, is highly correlated with Verbal IQ ($r=.43$). This would not be the case in countries where all children in the relevant age group remained in school and grade promotion was based on age. In Chile, however, as noted above, more than 40 per cent of the age group were not in school, and almost 20 per cent of those in school were below the fifth grade. As soon as Verbal IQ is used as a control, the relationship between Grade and Science Score becomes negative. That is, students in the higher grades perform less well than their equally able school mates in the lower grades. As shown in Table 2, however, the Chilean sample covers many grades. In the higher grades, a great deal of specialization has occurred. The number of students in the Technical and Academic Scientific programs, however, is small, amounting to less than 5 per cent of the total sample and not more than 12 per cent at any grade level. A plausible interpretation is that for the students in the lower grades, the tested material was fresher, since it was being currently taught as a part of a primary school curriculum. The large majority of students in the higher grades, however, had not studied science for a year or two. They had forgotten many details, and their test

scores were therefore lower than those of their equally able younger school mates. 1/

Turning to Tables A-3 and A-4, it will be noted that in India, Grade does not have a negative direct effect on Science Score, as it does in Chile. This is probably a reflection of a lower degree of specialization in the Indian schools, so that larger proportions of school students continue to study science in some form in the higher grades. This problem, however, has not been investigated further.

A final observation is that in both Chile and India, the residual is smaller than Comber and Keeves reported (1973, p. 261). For their analysis, the unexplained residual was .87 for both countries.

Tables A-1 to A-4 provide the full results of the path analysis. They thus enable an overview of the full network of interrelationships at play in the school science learning situation. Table 12 provides a summary of the direct effects found in Tables A-1 to A-4. What is immediately obvious from Table 12 is that there is very nearly complete agreement between parameter estimates for NIPALS Models A and B. The differences can, as noted above, be taken as a measure of our ignorance as to the appropriate models and methods. There is also fair agreement between the results for Chile and India.

Comparing the four columns in Table 12, it can be noted that there are several variables for which the direct effect parameters for the four analyses tend consistently to be large compared to the differences between them. Thus Home tends to have a modest positive effect, while Verbal IQ tends to have a very strong effect. Teacher Training tends to have a modest or moderate effect. Methods tend to have a moderate effect, stronger than Home and second only to Verbal IQ. Region has only a slight effect. School Atmosphere has no effect. Other variables have inconsistent effects.

1/ It was discovered during the writing of the report that the Resource variable was incorrectly constructed in Chile. The correct values of the correlations between the Resource variables and Science Score should be low but positive. Due to its relatively low value both in its existing form and in its correct form, it is unlikely that the error has significantly influenced the results for the other variables.

Table 12: THE DEPENDENCE OF SCIENCE ACHIEVEMENT ON ITS EXPLANATORY VARIABLES. STANDARDIZED PATH COEFFICIENTS

Explanatory Variable	Chile		India		Range	
	Model A	Model B	Model A	Model B	Low	High
* REGION		.04			0	.04
HOME	.08	.07	.09	.08	.07	.09
STUSEX	-.16	-.14			-.16	0
VERBALIQ	.47	.46	.48	.46	.46	.48
AGE	.06	.06			0	.06
GRADE	-.12	-.13	.08	.09	-.13	.09
HOMWRK			.08	.08	0	.08
SCHTYPE			.07	.08	0	.08
ENROLI		-.08	.12	.12	-.08	.12
RESOURC	-.09	-.05	.06	.07	-.09	.07
TEASEX			-.09	-.09	-.09	0
SCITEEXP			.06	.06	0	.06
TEATRΝ	.07	.14	.07	.06	.06	.14
METHODS	.11	.18	.10	.10	.10	.18
SCHATMOS					0	0
OPSCI	.16	.15			0	.16
Residual	.80	.79	.77	.77		

*
Ncte. A listing of variables is shown in Table 7.

Table 13 provides an overview of the total path effects. In general, the results are much the same, but now some effects become more clear. Whereas in India, Student Sex had no direct effect, its indirect effect was negative, i.e., girls tended to have lower scores than boys. It can be seen from Tables A-3 and A-4 that the major single reason for the negative indirect effect of Student Sex is that Student Sex is a major determinant of Teacher Sex (i.e., boys tend to have men teachers and girls tend to have women teachers), and Teacher Sex has a negative total effect.

Table 13: TOTAL PATH EFFECTS OF THE EXPLANATORY VARIABLES ON SCIENCE ACHIEVEMENT. TOTAL PATH COEFFICIENTS

Explanatory Variables	Chile		India		Range	
	Model A	Model B	Model A	Model B	Low	High
★ REGION	-.03	.02	.04	.04	-.03	.04
HOME	.05	.06	.10	.08	.05	.10
STUSEX	-.16	-.16	-.08	-.08	-.16	-.08
VERBALIQ	.50	.50	.56	.56	.50	.56
AGE	.06	.04	.03	.02	.02	.06
GRADE	-.07	-.08	.13	.14	-.08	.14
HOMWRK	.03	.02	.10	.10	.02	.10
SCHTYPE	.01	.01	.04	.07	.01	.07
ENROL1	-.01	-.06	.12	.12	-.06	.12
RESOURC	-.08	-.06	.09	.09	-.08	.09
TEASEX	-.05	-.06	-.10	-.10	-.10	-.05
SCITEEXP	.01	-.02	.08	.08	-.02	.08
TEATRN	.12	.11	.07	.07	.07	.12
METHODS	.11	.19	.10	.10	.10	.19
SCHATMOS					0	0
OPSCI	.16	.15			0	.16

★
Note: A listing of variables is shown in Table 7.

That is, all other things being equal, girls have as high science achievement scores as boys, but in reality all other things are not equal. Girls tend to have women teachers, and women teachers tend to be less "effective" (in the very restricted sense that the effect of Teacher Sex on Science Score is negative). A similar result is seen for Teacher Sex in Chile. Their Teacher Sex had no direct effect but a negative indirect effect. From Tables A-1 to A-2, it can be seen that the reason for the negative indirect effect is the negative effect of Teacher Sex on Teacher Training and Methods. That is, all other things being equal, women teachers tend to be as effective as men teachers. In reality, however, other things are not equal, and women teachers tend to have lower levels of training and to use less effective methods. This also illustrates the fact that causal and non-causal relationships are inextricably intertwined. Variations in methods can be hypothesized to "cause" variations in achievement, but differences in teacher training are "non-causally associated" with teacher sex. Women teachers, however, can be given the same training as men and can be taught to use the same methods as men. Teacher sex would then have no effect on teacher training or methods and thus would have no effect on student achievement.

DISCUSSION: THE EFFECTS OF TEACHERS ON SCIENCE ACHIEVEMENT

What does the present analysis suggest about the relative potential contributions to improvement of student cognitive outcomes? What role can be played by the teachers? In order to come to grips with these questions, it is necessary to have some scale with which to describe teacher training and changes in teacher training. Since no "natural" or "concrete" scale is available, we must use a scale based on the specific samples investigated. That is, we shall use a scale in which the scaling unit is the standard deviation of the teacher training variable in the respective samples. It will be an abstract scale which can be understood in concrete terms only by reference to the concrete circumstances in the country in question. We shall, of course, confine our thinking to the framework of the Population II teachers investigated here.

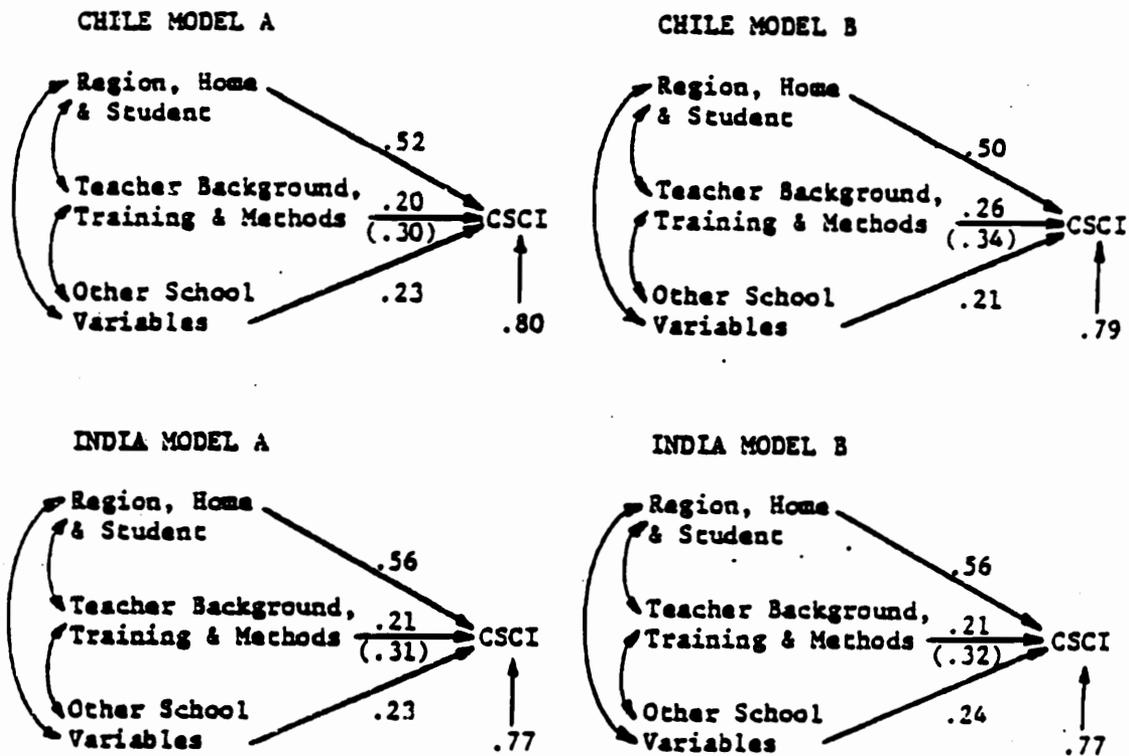
To begin with, let us, in our imagination, line up all teachers in a country in order, from the most poorly trained to the most highly trained. In making such rankings, we shall take into account all relevant forms of training, including in-service training. Let us assign a value of zero to the midpoint of that line of teachers. Let us, furthermore, assume that the teachers are normally distributed with respect to their training. That is, most teachers cluster around the mean in terms of training, with relatively few teachers at the extremes. In fact, we can define scale units (standard deviations) such that approximately 68 per cent of the teachers fall between scale points -1 and +1, an additional 27 per cent fall outside these points but between scale points -2 and +2, and the remaining 5 per cent fall outside these points. Now since most teachers have nearly the same training, the mean level of training of

the upper 50 per cent of teachers is not extremely different from the mean level of training of the whole population of teachers. In fact, the whole population of teachers has, as noted above, a mean level of training set at zero on our abstract scale, and the most highly trained 50 per cent of teachers have a level of training of approximately 0.7, i.e., the same level of training as teachers at the scale point 0.7 (further discussion of the methods of calculation in this example are given in Section 3 of Annex B). It can be shown that if the level of formal training (such as it was, as measured by the Teacher Training variable) of all teachers were raised in the future to the mean of the most highly trained 50 per cent of all teachers today, then, according to the total path effects from the above analysis, mean Science Score would rise from 9.6 to 10.3 in Chile and from 8.3 to 8.7 in India. These increases represent 8 and 55 per cent of a standard deviation in achievement in the respective countries. These figures include indirect effects through causally subsequent variables.

Suppose, however, that we regard the parameter estimate for the Teacher Training variable as too conservative an estimate, since it is based on teacher training as it was among the sampled teachers. Suppose, instead, that we regard all teacher variables, including teacher background, teaching methods, and the residual school variable, Opportunity to Learn, as potential sources of change through various forms of teacher training. That is, suppose we are able, through various forms of training, to get less experienced, poorly trained, less successful teachers to exhibit the same kinds of classroom behavior as experienced, well trained, successful teachers today, and at the same time improve the classroom behavior even of today's experienced and trained teachers. What would the effects of such changes be? In posing such a problem, teacher training variables are really taken to be surrogates for measures of teacher classroom behavior, which, due to the crudeness of our instruments today, we are not able to measure directly. For the objective of improving student achievement, teacher training is of no intrinsic interest--only teacher classroom behavior. It is from the objective of improving teacher classroom behavior that teacher training becomes intrinsically interesting. From that point of view, however, formal teacher training, such as it was, is only one of many alternatives. Similarly, other teacher variables, such as sex, experience, etc., are also interesting only as surrogates for behavioral measures. No behavior is, in any final sense, bound to sex, experience, training, etc. What we observe are established patterns of behavior, but these patterns can be changed through will. Women teachers can learn those behaviors which their male colleagues exhibit which account for the effects shown in Tables 12 and 13. In that sense, all teacher variables are subject to manipulation because teachers themselves are human and have a will to learn new behaviors, i.e., to manipulate their own classroom behavior.

On the basis of the coefficients shown in Tables A-1 to A-4, approximations to the direct effects of student, teacher, and school aggregates were computed (see Annex B, Section 4). The results are shown in Figure 2.

If we are to replicate our above example using the coefficients shown in Figure 2, we will line up all teachers in a country not on the basis of their formal training but on the basis of the effectiveness of their behaviors. We will assume a normal distribution with a mean of zero and standard deviation of 1. Now if the mean effectiveness of all teachers could be upgraded, by any form of teacher training, to the mean effectiveness of the most effective 50 per cent of all teachers today, then, according to the coefficients shown in Figure 2, mean Science Score would rise from 9.6 to 11.0 in Chile (mean of estimates for Models A and B) and from 8.3 to 9.6 in India. These increases correspond to 16 and 15 per cent of a standard deviation in achievement in the respective countries.



NOTE: The numbers in parentheses indicate aggregated effects of teacher and school variables together.

Figure 2. Simplified Path Models Showing Aggregated Effects of Student, Teacher, and School Variables.

Are these estimates (which are certainly statistically significant) socially significant? Do they make investment in teacher training programs worthwhile? What changes can be expected if teacher training programs are not carried out? From Table 12 it can be seen that the residual influence on Science Score is approximately 0.80 and thus by far the strongest aggregate effect. The residual effect is stronger than the combined effects of all student, teacher, and school variables measured. Thus, improvement in this residual of factors could lead to far larger improvements in achievement levels than those mentioned above. These residual factors, however, are, by definition, unknown to us. Until they become known to us, they also lie outside our control. They may rise and lead to improved cognitive performance, or they may fall and lead to even lower levels of achievement than today. Or the combination of factors may not change at all in the aggregate, leading to unchanged performance. The student background variables, on the other hand, are known to us but outside the range of control of educational authorities. The teacher and school variables, however, are known to us and are within the range of control of the educational authorities. Improvement in both sets of factors involves financial costs. Neither textbooks and AV materials nor teacher training programs are free.

It would be quite beyond the scope of the present report to attempt to indicate whether or under what circumstances it would be most appropriate to improve teacher training or to improve other school factors. That would certainly depend on the relative availability of these two factors, on the relative costs of labor and materials, on the relative suitability of expatriate teachers and foreign textbooks and other instructional materials, etc. For example, a country may experience a relative redundancy of qualified teachers and a scarcity of buildings and materials, or the contrary conditions may prevail. There may be an adequate supply of teachers from the former colonial country, but from a pedagogical point of view and from the point of view of national aspirations, such teachers may be deemed inappropriate in the future. Alternatively, there may be an adequate supply of teachers from a neighboring country with similar language and culture, and such teachers may be deemed quite appropriate for the present. Obviously, decisions concerning specific investments in specific countries require studies of a very different kind from the one reported here.

It would likewise be beyond the scope of the present report to attempt to indicate whether, in a particular country, it is wise to invest at all in upgrading student achievement. This would depend on such factors as the redundancy or scarcity of trained labor, the intrinsic value of education, etc. Moreover, the labor force is clearly segmented both horizontally and vertically, so that the question of redundancy or scarcity of trained labor does not apply to a homogeneous population as a whole but to more or less distinct groups in the population and types and levels of education. Such decisions also require other kinds of studies.

An important conclusion can be drawn, however. The estimates of teacher effects on student science achievement calculated in the present study do not provide evidence on what economic rate of return countries

might gain on investments in teacher training programs. That depends on a variety of pedagogical and economic considerations. What they do suggest however, is that if investments are made in teacher training programs, there will be a return on the investment in terms of increases in the level of student cognitive outcomes of schooling.

ANNEX A

RESULTS OF THE PATH ANALYSIS

Table A-1: PATH COEFFICIENT MATRIX FOR CHILE. MODEL A

Independent Variables	Dependent Variables													TOTAL PATHS	TOTAL CORRELATION
	GRADE	HOMWRK	ASCHTYPE	ENROLI	ARESOUC	TEASEX	SCITEEXP	ATEATRN	AMETHODS	SCHATMOS	OPSCI	CSCI	INDIRECT PATHS		
AREGION *		-.06		.13		.08	.20	-.13			-.05		-.03	-.03	.08
AHOME	.38			.08	.08		.12	.09	-.14	-.40	.06	.08	-.03	.05	.19
STUSEX				.07		.42	.12	.12	.06			-.16	.0	-.16	-.19
VERBALIQ	.33		.15	-.10				.16	.14	.25	.11	.47	.03	.50	.52
AGE	.24		.06		.09	-.06		.10		.07		.06	-.01	.06	.05
GRADE				.39	.10	-.16		.10	-.22	.14	.41	-.12	.05	-.07	.20
HOMWRK					-.14	.05	.06	.06	.04	-.08	.06		.03	.03	.04
ASCHTYPE					-.07	-.07	-.09			.10			.01	.01	.11
ENROLI					-.12	.06	.10	-.06			-.08		-.01	-.01	-.01
ARESOUC						-.06	.04	.11		-.12	-.06	-.09	.01	-.08	-.06
TEASEX							.10	-.32	-.08				-.05	-.05	-.18
SCITEEXP								-.10	.20	.06			.01	.01	0
ATEATRN									.48			.07	.05	.12	.23
AMETHODS												.11	0	.11	.19
SCHATMOS													0	0	.08
OPSCI												.16	0	.16	.28
Residual	.77	1.00	.99	.90	.97	.88	.94	.87	.84	.88	.88	.80			

* Note: A listing of variables is shown in Table 7.

Table A-2: PATH COEFFICIENT MATRIX FOR CHILE. MODEL B

Independent Variables \ Dependent Variables	GRADE	HOMWRK	BSCHTYPE	ENROLI	BRESOURC	TEASEX	SCITEEXP	BTEATR	BMETHODS	SCHATMOS	OPSCI	CSCI	INDIRECT PATHS	TOTAL PATHS	TOTAL CORRELATION
* BREGION		-.07	-.06	.10		.08	.18	-.08				.04	-.02	.02	.09
BHOME	.25	.06			.08		.09	.09		-.41		.07	-.02	.06	.15
STUSEX				.06		.41	.12		.07			-.14	-.02	-.16	-.19
VERBALIQ	.39		.17	-.09				.09	.22	.23	.10	.46	.04	.50	.52
AGE	.26		.06		.08	-.07		.05		.07		.06	-.02	.04	.05
GRADE		-.06		.44	.09	-.17		.27	-.08	.08	.41	-.13	.05	-.08	.20
HOMWRK					-.14	.06	.06		.08	-.05	.04		.02	.02	.04
BSCHTYPE				-.04	-.09	-.06	-.09			.14	-.05		.01	.01	.11
ENROLI					-.13	.07	.13	.14	.10		-.12	-.08	.02	-.06	-.01
BRESOURC							.05		.06	-.13	-.10	-.05	0	-.06	-.04
TEASEX							.09	-.15	-.24		.06		-.06	-.06	-.18
SCITEEXP								-.16		.06			-.02	-.02	0
BTEATR									-.28		.16	.14	-.03	.11	.22
BMETHODS											.06	.18	.01	.19	.23
SCHATMOS													0	0	.08
OPSCI												.15	0	.15	.28
Residual	.82	1.00	.98	.90	.97	.88	.94	.86	.93	.87	.87	.79			

* Note: A listing of variables is shown in Table 7.

Table A-3: PATH COEFFICIENT MATRIX FOR INDIA. MODEL A

Independent Variables	Dependent Variables														TOTAL CORRELATION
	GRADE	HOMWRK	BSCHTYPE	ENROLI	BRESOURC	TEASEX	SCITEEXP	BTEATR	BMETHODS	SCHATMOS	OPSCI	CSCI	INDIRECT PATHS	TOTAL PATHS	
* REGION	.08		-.23	-.26		.10	.16				.20		.04	.04	.10
AHOME	.14					.06		-.04		.06	-.04	.09	.01	.10	.12
STUSEX	-.05	-.10	.07		-.08	.58	-.08						-.08	-.08	-.04
VERBALIQ	.24		.07	.07	.04	-.09	.17	.10	.10	.21	-.12	.48	.08	.56	.57
AGE	.29		-.04	-.07		.04	-.05	-.06		.05			.03	.03	.03
GRADE			.43	.18	.17	-.08	-.08				.20	.08	.05	.13	.28
HOMWRK			.14		.07	.10	.22			.06	.08	.08	.02	.10	.11
ASCHTYPE				-.17	.12	.09	-.24			-.05		.07	-.04	.04	.19
ENROLI					.18	.14	-.11	.04				.12	0	.12	.20
ARESOURC						-.05	-.05	.13	.15		.25	.06	.02	.09	.22
TEASEX							-.09					-.09	-.01	-.10	-.08
SCITEEXP								.28				.06	.02	.08	.10
ATEATR									.06	.05	.14	.07	.01	.07	.18
AMETHODS											.07	.10	0	.10	.19
ASCHATMOS													0	0	.13
OPSCI													0	0	.11
Residual	.91	1.00	.87	.94	.94	.75	.90	.94	.98	.97	.89	.77			

* Note: A listing of variables is shown in Table 7.

Table A-4: PATH DIFFERENTIAL ANALYSIS FOR INDIA. MODEL 8

Independent Variables	Dependent Variables													TOTAL PATHS	TOTAL CORRELATION
	GRADE	HOMWRK	ASCHTYPE	ENROLI	ARESOJRC	TEASEX	SCITEEXP	ATEATRN	AMETHODS	ASCATMOS	OPSCI	CSCI	INDIRECT PATHS		
* REGION	.10		-.17	.29		.11	.18				.19		.04	.04	.10
BHOME	.09			-.05		.04	-.04		-.04	.04		.08	0	.08	.12
STUSEX	-.04	-.10	.11		-.08	.58	-.08						-.08	-.08	-.04
VERBALIQ	.23		.11	.06	.05	-.10	.18	.09	.15	.19	-.13	.46	.10	.56	.57
AGE	.29			-.06		.03	-.05	-.06				.04		.02	.03
GRADE			.32	.13	.14	-.09	-.12					.21	.09	.05	.28
HOMWRK			.13		.07	.09	.21					.06	.08	.08	.11
BSCHTYPE				.06	.11	.15	-.18	.06	-.06	-.05			.08	-.01	.21
ENROLI					.17	.13	-.09						.12	0	.20
BRESOURC						-.03	-.08	.16	.12				.22	.07	.22
TEASEX							-.08						-.09	-.01	-.08
SCITEEXP								.28					.06	.02	.10
BTEATRN									.05				.15	.06	.18
BMETHODS													.06	.10	.19
BSCHATMOS														0	.10
OPSCI														0	.11
Residual	.92	1.00	.91	.94	.95	.74	.91	.94	.98	.98	.90	.77			

Note: * A listing of variables is shown in Table 7.

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BIBLIOGRAPHY

- COLEMAN, James S. "Methods and Results in the IEA Studies of Effects of School on Learning." Review of Educational Research. 45:335-386, 1975.
- COMBER, L.C., and John P. Keeves. Science Education in Nineteen Countries. Stockholm: Almqvist and Wiksell, 1973.
- DUNCAN, Otis D. "Path Analysis: Sociological Examples," in H. M. Blalock, Jr. Causal Models in the Social Sciences. New York: Macmillan, 1971, pp. 101-114.
- DUNCAN, Otis D. Introduction to Structural Equation Models. New York: Academic Press, 1975.
- JORESKOG, K. G. "A General Method for Estimating a Linear Structural Equation System," in Structural Equation Models in the Social Sciences. New York: Seminar Press, 1973, pp. 85-112.
- JORESKOG, K. G. "Structural Equation Models in the Social Sciences: Specification, Estimation and Testing," Research Report 76-9. Uppsala Sweden Institute of Statistics. 1976.
- KIM, Jae-on and Frank J. Kobout. "Multiple Regression Analysis: Subprogram Regression," in Norman H. Nie, et. al., (eds.) SPSS: Statistical Package for the Social Sciences (Second edition). New York: McGraw-Hill, 1975.
- LAZARSFELD, Paul. "Latent Structure Analysis," in I.S. Koch (ed.), Psychology: A Study of Science III. New York: McGraw-Hill, 1959.
- NOONAN, Richard D. School Resources, Social Class, and Student Achievement. Stockholm: Almqvist and Wiksell, 1976.
- NOONAN, Richard D. "The Effects of Teacher Upgrading and Domestication in Botswana: A Path-Analytic Study of Causal and Allocation Effects of Teacher Training." Annex in Final Report of the National Commission on Education in Botswana, 1977.
- NOONAN, Richard and Herman Wold. "NIPALS Path Modelling With Latent Variables: Analyzing School Survey Data Using Nonlinear Iterative Partial Least Squares," Scandinavian Journal of Educational Research. 21:33-61, 1977.
- PEAKER, Gilbert F. An Empirical Study of Education in Twenty-One Countries: A Technical Report. Stockholm: Almqvist and Wiksell, 1975.
- TUKEY, John W. "Causation, Regression and Path Analysis," in O. Kempthorne, et. al., (eds.). Statistics and Mathematics in Biology. Ames, Iowa: Iowa State College Press, 1954, pp. 35-66.

- TURNER, M. E. and Stevens, C.D. "The Regression Analysis of Causal Paths," Biometrics. 15:236-258, 1959.
- WOLD, Herman, "Nonlinear Iterative Partial Least Squares (NIPALS) Modelling: Some Current Developments," in P. R. Krishnaiah (ed.), Multivariate Analysis - III. New York: Academic Press, 1973. pp. 383-407.
- WOLD, Herman. "Soft Modelling by Latent Variables: the Nonlinear Iterative Partial Least Squares (NIPALS) Approach," in J. Gani (ed.), Perspectives in Probability and Statistics. New York: Applied Probability Trust, 1976, pp. 117-142.
- WRIGHT, Sewell. "The Method of Path Coefficients," Annals of Mathematical Statistics. 5:161-215, 1934.

ANNEX TABLE I

TYPOLOGY OF STUDIES RELATING TEACHER CHARACTERISTICS
AND STUDENT ACHIEVEMENT IN LESS DEVELOPED COUNTRIES

<u>SURVEY STUDIES</u>		<u>EXPERIMENTAL STUDIES</u>	
<u>Primary Level</u>	<u>Secondary Level</u>	<u>Primary Level</u>	<u>Secondary Level</u>
<p>MULTI-VARIATE STUDIES</p> <p>Carnoy (1971) Carroll (1975) Comber & Keeves (1973) Farrell & Schiefelbein (1975) Fuller & Chantavanich (1976) Heyneman (1976 a & b) Lewis & Massad (1975) Levy (1971) Purves (1973) Ryan (1972) Shukla (1974) Thias & Carnoy (1972) Thorndike (1973)</p>	<p>Beebout (1972) Bibby & Peil (1974) Carnoy (1971) Carroll (1975) Comber & Keeves (1973) Currie (1977) Klees (1974) Lewis & Massad (1975) Purves (1973) Shukla (1974) Silvey (1972) Somerset (1968) Thias & Carnoy (1972) Thorndike (1973) Youdi (1972)</p>	<p>Nasoetion, et al (1976)</p>	<p>Hornik (1975) Okunrotifa (1974; 1975)</p>
<p>BI-VARIATE STUDIES</p> <p>Heyneman (1976b) Husén (1977) Izquierdo & Guzman (1971) Philippines Dept. of Education & Culture (1976) Schmelkes (1972) Williams (1965)</p>	<p>Durojaiye (1974) Husen (1977) Windham (1970)</p>	<p>Ellson (1973) Rowe (1966)</p>	

ANNEX TABLE II

COUNTRIES REPRESENTED IN STUDIES COVERED BY REPORT

<u>Primary Level</u>	<u>Secondary Level</u>
Botswana	Botswana
Chile	Chile
Guatemala	Congo
Hong Kong	El Salvador
India	Ghana
Indonesia	India
Iran	Iran
Kenya	Malaysia
Malaysia	Mexico
Mexico	Nigeria
Philippines	Puerto Rico
Puerto Rico	Sierra Leone
Thailand	Thailand
Uganda	Uganda
Total Countries Represented = 19	

ANNEX TABLE III

TEACHER VARIABLES BY RESEARCH AUTHOR(S)

Author(s)	Background				Qualification						Behavior & Attitudes					IEA Block
	Sex	Age	SES	Home English	Educ Attmt	Educ Qual	Cog Abil	Tea Exp	Sal	Upgr Pr	Att to Studs	Meth	Abs Pun	Job	Behav	
Beebout						x		x								
Bibby & Peil						x			x							
Carnoy	x				x	x		x								
Carroll	x					x		x							x	
Comber & Keeves	x					x								x	x	
Currie						x										
Durojaiye											x			x		
Ellson						x						x				
Farrell & Schiefelbein		x	x													
Fuller & Chantavanich		x			x	x	x				x		x			
Heyneman			x	x	x	x	x	x								
Hornik												x				
Husén		x			x	x		x		x						
Izquierdo & Guzman					x		x	x					x	x		
Klees	x	x				x		x				x		x		
Lewis & Massad	x						x							x	x	
Levy					x				x							
Nasoetion, et al.										x						
Okunrotifa												x				
Philippine Ed & Culture											x					
Purves	x				x										x	
Rowe											x					
Ryan	x		x				x							x		
Shukla															x	
Schmelkes							x	x								
Silvey						x										
Somerset						x								x		
Thias & Carnoy								x	x							
Thorndike															x	
Williams						x										
Windham						x										
Youdi						x										

Note: The order of the above 16 variables corresponds to that used in the text.

ANNEX TABLE IV

TEACHER VARIABLES AND RELATIONSHIPS TO STUDENT PERFORMANCE (p. 1)

Independent Variable	Author(s)	Country	School Level ^a	Criterion Variable	Relationship			Comments
					+	0	-	
A. DEMOGRAPHIC AND BACKGROUND VARIABLES								
1. Teacher Sex (M=1, F=2)								
	Carnoy	Puerto Rico	P	Spanish Reading & Gen. Ability			-	% male teachers + related to high Ach for P grades but - for S grades.
			S	Same	+			
	Klees	Mexico	S	Math & Spanish		0	-	Males more effective for Math; no differences for Language. No figures.
	Ryan	Iran	P	Math & Language	+			r = .28
IEA Between-School Comparisons								
	Comber & Keeves	Chile	Pop II	Science Ach			-	r = -.32, p < .01
		Chile	Pop IV	Science Ach			-	r = -.46, p < .01
		India	Pop I	Science Ach		0		r = -.04, NS
		India	Pop IV	Science Ach		0		r = -.05, NS
		Iran	Pop IV	Science Ach		0		r = -.12, NS

^a P = primary grades, S = secondary grades.

ANNEX TABLE IV (continued, p. 2)

Independent Variable	Author(s)	Country	School Level ^a	Criterion Variable	Relationship			Comments
					+	0	-	
1. <u>Teacher Sex (continued)</u>								
<u>IEA Between-Student Comparisons</u>								
	Carroll	Chile	Pop IV	French Reading	+		$t = 3.36, p < .005$	
		Chile	Pop IV	French Listening	+		$t = 6.51, p < .005$	
	Comber & Keeves	Chile	Pop I	Science Ach		-	$r = -.10, p < .01$	
		Chile	Pop II	Science Ach		-	$r = -.23, p < .01$	
		India	Pop I	Science Ach	+		$r = .11, p < .01$	
		India	Pop II	Science Ach		-	$r = -.09, p < .01$	
		Iran	Pop I	Science Ach		-	$r = -.05, p < .05$	
		Iran	Pop II	Science Ach	+		$r = .08, p < .01$	
		Thailand	Pop II	Science Ach		-	$r = -.07, p < .01$	
	Lewis & Massad	Chile	Pop IV	English Reading		-	$r = -.23, p < .01$	
		Chile	Pop IV	English Listening	+		$r = .09, p < .01$	
		Thailand	Pop II	English Reading	+		$r = .06, p < .01$	
		Thailand	Pop IV	English Reading		0	$r = .02, NS$	
	Purves	Chile	Pop II	Literature		-	$r = -.09, p < .01$	
		Chile	Pop IV	Literature	+		$r = .07, p < .01$	
		Iran	Pop II	Literature		0	$r = .01, NS$	
		Iran	Pop IV	Literature		-	$r = -.10, p < .01$	

ANNEX TABLE IV (continued, p. 3)

Independent Variable	Author(s)	Country	School Level ^a	Criterion Variable	Relationship			Comments
					+	0	-	
2. <u>Teacher Age</u>								
	Farrell & Schiefelbein	Chile	P&S	Math & Verbal	+			$\beta = .067, p < .01$
	Fuller & Chantavanich	Thailand	P	Math & Thai		0		Slightly negative, but not significant; $r = -.038$ and $-.036$ with beginning and end of year scores.
	Huén	Botswana	P	Mathematics	+			F-value = 6.09, $p < .01$
				Reading	+			F-value = 7.85, $p < .01$
	Klees	Mexico	S			0		Figures not reported.
3. <u>Teacher SES</u>								
	Farrell & Schiefelbein ^b	Chile	P&S	Math & Verbal	+			$\beta = .0386, p < .01$
	Heyneman	Uganda	P	PLE exam ^c		0		$r = -.14, NS$. Data aggregated by school.
	Ryan	Iran	P	Math & Language	+			$r = .19; \beta = .167$

^b Composite of father's education and occupation, mother's education, and teacher level of education.

^c Primary Leaving Exam consists of equally-weighted sections of math, English, and general knowledge in science, history and geography.

ANNEX TABLE IV (continued, p. 4)

Independent Variable	Author(s)	Country	School Level ^a	Criterion Variable	Relationship			Comments
					+	0	-	
4. <u>Frequency of English in Childhood Home</u>								
	Heyneman	Uganda	P	PLE exam ^c		0		r = -.20, N.S. Data aggregated by school.
B. <u>TEACHER QUALIFICATION VARIABLES</u>								
5. <u>Teacher Educational Attainment</u>								
	Carnoy	Puerto Rico	P&S	Spanish Reading & Gen Ability	+(P)	0(S)		Ed attainment important for primary but not secondary grades. Also more impact on low SES students in P grades.
	Fuller & Chantavanich	Thailand	P	Math & Thai		0		r = .11 and .12, NS, for Ach at beginning and end of year scores.
	Heyneman	Uganda	P	PLE exam ^b		0		r = -.11, NS
	Husén	Botswana	P	Mathematics	+			Educational attainment important for Math Ach only.
				Reading		0		
	Izquierdo & Guzman	Mexico	P	Math & Lang		0		r = -.069, NS

ANNEX TABLE IV (continued, p. 5)

Independent Variable	Author(s)	Country	School Level ^a	Criterion Variable	Relationship			Comments
					+	0	-	
5. <u>Teacher Educational Attainment (continued)</u>								
	Levy	42 LDCs ^d	P	Dropout Rates		0		Data aggregated by country. Variable did not enter stepwise regression. No figures reported.
<u>IEA Between-Student Comparisons</u>								
	Purves	Chile	Pop II	Literature	+			r = .34, p < .01
		Chile	Pop IV	Literature		0		r = .03, NS
		Iran	Pop II	Literature	+			r = .11, p < .01
6. <u>Teacher Credentials and Certification (Level of Training)</u>								
	Beebout	Malaysia	S	MC Exam ^e	+			r = .268 for total sample; b = .345 for Malay schools only.
	Bibby & Peil ^f	Ghana	S	GC Exams ^g	+			School-teacher effects more important than home effects: $\xi^2 = .41$, $\eta^2 = .28$ compared with .08 and .02.

^d The countries include 15 from Latin America, 14 from Africa and Middle East, and 13 from Asia.

^e Standardized achievement battery taken at completion of upper secondary school. Most important components for Malay Medium students were geography and Malay, for English Medium geography and science.

^f Proxy variable only. Teacher qualifications inferred from school quality.

^g Ordinary Level General Certificate of Education exam of 5th form students.

Independent Variable	Author(s)	Country	School Level ^a	Criterion Variable	Relationship			Comments
					+	0	-	
6. Teacher Credentials (continued)								
	Carnoy	Puerto Rico	P&S	Spanish Reading & Gen. Ability	+(S)	0(P)		Qualifications affect Ach only at secondary level.
	Currie	Uganda	P	Examination Pass Level ^h	+			B = .31 and .17 for 1954 and 1964 graduates. The most important of the independent variables.
	Ellson	Malaysia	P	Malay Reading			-	t-test = 2.18, p < .05, between experimental (untrained teachers) and control (trained teachers) classes. Untrained teachers had greatest impact.
	Fuller & Chantavanich	Thailand	P	Mathematics & Thai	+			r = .159 and .093 for beginning and end of year scores; Beta = .068, p < .01, but adds little to variance explained.
	Heyneman	Uganda	P	PLE exam ^b			0	r = .09, NS.
	Husen	Botswana	P	Mathematics	+			Teacher training has an effect on Reading Ach but not Math Ach. However, between-school comparison show trained teachers more effective in both subjects.
				Reading			0	
	Klees ⁱ	Mexico	S	Mathematics & Language	+			Figures not reported.

^h Exam Pass Level = 1st year pass, 2nd year pass, 3rd year pass & GCE, and Fail.

ⁱ Composite index including teacher educational attainment and level of training.

ANNEX TABLE IV (continued, p. 7)

Independent Variable	Author(s)	Country	School Level ^a	Criterion Variable	Relationship			Comments
					+	0	-	
6. Teacher Credentials (continued)								
	Silvey ^f	Uganda	S	SS Exams and CSC Exams ^j		0		Cross-tabs, no controls, no qualification effects.
	Somerset ^f	Uganda	S	CSC Exams ^j		0		Author suggests that school and teacher effects are more pronounced at primary level and are irreversible.
	Williams	Guatemala	P	Dropout Rates	+			The regions with more qualified teachers have higher retention.
	Windham ^j	Sierra Leone	P	Occup. Aspirations		0		
	Youdi	Congo	S	Math & French	+			Teacher training the most important determinant of Ach. No figures reported.
<u>IEA Between-School Comparisons</u>								
	Comber & Keeves	Chile	Pop IV	Science Ach		0		r = .08, NS
		India	Pop IV	Science Ach	+			r = .23, p < .01
		Iran	Pop IV	Science Ach		0		r = .16, NS
<u>IEA Between-Student Comparisons</u>								
	Carroll	Chile	Pop IV	French Reading		0		t = NS
		Chile	Pop IV	French Listening			-	t = -2.41. No explanation given for the negative result.

ANNEX TABLE IV (continued, p. 8)

Independent Variable	Author(s)	Country	School Level ^a	Criterion Variable	Relationship			Comments
					+	0	-	
6. <u>Teacher Credentials (continued)</u>								
<u>IEA Between-Student Comparisons</u>								
	Comber & Keeves	Chile	Pop IV	Science Ach	+			r = .15, p < .01
		India	Pop IV	Science Ach	+			r = .10, p < .01
		Iran	Pop IV	Science Ach	+			r = .09, p < .01
7. <u>Teacher Ability and Achievement</u>								
	Fuller & Chantavanich	Thailand	P	Math & Thai		0		r = .11 and .13, NS, for beginning and end of year achievement.
	Heyneman	Uganda	P	PL Exam ^c	+			r = .31, p < .01. The only one of six teacher variables with a significant relationship with achievement.
	Izquierdo & Guzman	Mexico	P	Math & Thai		0		r = .038, NS
	Ryan	Iran	P	Language & Math	+			r = .14. Teacher ability is more strongly related to achievement in the poorest region ($\beta = .353$).

ANNEX TABLE IV (continued, p. 9)

Independent Variable	Author(s)	Country	School Level ^a	Criterion Variable	Relationship			Comments
					+	0	-	
7. <u>Teacher Ability (continued)</u>								
	Schmelkes	Mexico	P	Arith., Geometry & Language		0		Figures not reported.
<u>IEA Between-Student Comparisons</u>								
	Lewis & Massad	Chile	Pop IV	English Reading	+			$r = .07, p < .01$
		Chile	Pop IV	English Listening	+			$r = .14, p < .01$
		Thailand	Pop II	English Reading	+			$r = .11, p < .01$
		Thailand	Pop IV	English Reading			-	$r = -.10, p < .01$
8. <u>Teacher Experience</u>								
	Beebout	Malaysia	S	MC Exam ^e	+			$r = .031$ for total sample; $r = .268$ in interaction with qualifications. Regression coefficients (b) for Malay and English language schools are .407 and .219 respectively. As qualification increases, importance of experience decreases. More for Malay than English schools.
	Carnoy	Puerto Rico	P&S	Spanish Reading & Gen. Ability	+(P)		-(S)	Experience has positive effects and primary, but negative effects at secondary levels. More pronounced for reading Ach than Gen. ability.

ANNEX TABLE IV (continued, p. 10)

Independent Variable	Author(s)	Country	School Level ^a	Criterion Variable	Relationship			Comments
					+	0	-	
<u>Teacher Experience (continued)</u>								
	Heyneman	Uganda	P	PL Exam ^c		0		$r = -.03$, NS
	Husén	Botswana	P	Mathematics	+			Cross-tabs, F-value = 3.80, $p < .01$
				Reading Comp.	+			F-value = 4.13, $p < .001$
	Izquierdo & Guzman	Mexico	P	Math & Language	+			$r = .11$, $p < .05$
	Klees	Mexico	S	Math & Language			-	Figures not reported.
	Schmelkes	Mexico	P	Arith, Geometry & Language	+			Zero-order correlation NS. Figures not reported.
	Thias & Carnoy	Kenya	P	KPE ^k	+			"Seniority" in the equation makes difference between sig. and NS coefficients. Authors conclude that seniority is better predictor than qualifications. $R^2 = .06$.
<u>IEA Between-Student Comparisons</u>								
	Carroll	Chile	Pop IV	French Reading		0		$t = NS$
		Chile	Pop IV	French Listening			-	$t = -0.63$

KPE = Kenya Preliminary Exam, which is the leaving exam after seven years of primary schooling.

ANNEX TABLE IV (continued, p. 11)

Independent Variable	Author(s)	Country	School Level ^a	Criterion Variable	Relationship			Comments
					+	0	-	
9. <u>Teacher Salary</u>								
	Bibby & Peil ^f	Ghana	S	GC Exams ^g	+			School and teacher effects more important than home effects; $\xi^2 = .41$, $\beta = .28$ compared with .08 and .02 respectively.
	Levy	42 LDCs	P	Dropout rates		0		Data aggregated at country level. Teacher salaries were unrelated to dropout rates, but author claims evidence inconclusive.
	Thias & Carnoy	Kenya	P	KPE ¹	+			Average teacher salary has significant effect on exam score at primary level. $R^2 = .006$, $B = .079$, $p < .05$.
			S	HSC ¹				
10. <u>Teacher Upgrading Programs</u>								
	Husén	Botswana	P	Mathematics	+			The relationship is stronger for Reading Comp. than for Math.
				Reading Comp.	+			
	Nasoetion, et al.	Indonesia	P	Bahasa Indonesia	+			$r = .146$ between upgrading and post-test results; $R^2 = .1219$, increment due to upgrading = .0042, $p < .05$.

¹ KPE = Kenya Preliminary Exam (of footnote k); HSC = Higher School Certificate Exam, administered at end of Form VI.

Independent Variable	Author(s)	Country	School Level ^a	Criterion Variable	Relationship			Comments
					+	0	-	
C. <u>TEACHER BEHAVIOR AND ATTITUDES</u>								
ii. <u>Teacher Expectations of Students</u>								
	Durojaiye	Uganda	S	SAT ^m	+			r = .162, $p < .05$ for rural boys; r = .14, .113, and .146 (all NS) for rural girls and urban boys and girls respectively. SES of students was negatively related to performance.
	Fuller & Chantavanich	Thailand	P	Math & Thai	+			r = .217 and .228 for beginning and end of year performance. $\beta = .101$, was 5th most important determinant of Ach in stepwise regression.
	Philippines Dept. of Ed. & Culture	Philippines	P	General Academic Achievement ⁿ	+			Cross-tabs only. "As teacher's evaluation becomes more positive, the students' performance also increases above the levels of their own self-esteem."
	Rowe	Hong Kong	P	Academic Failure ^o	+			Experimental design, in-depth study of 100 failures and non-failures. Teacher expectations related to failure, more in Arithmetic than Chinese or English.

^m Scholastic Aptitude Test. Components not specified.

ⁿ Performance in nine subject areas: Reading, Language, Math & Science. Scores were combined to form an average standardized score.

^o Scores on Arithmetic, Chinese and English.

ANNEX TABLE IV (continued, p. 13)

Independent Variable	Author(s)	Country	School Level ^a	Criterion Variable	Relationship			Comments
					+	0	-	
12. <u>Teaching Method</u>								
	Ellson	Malaysia	P	Malay Reading	+			t = 2.18, p < .05 between programmed and conventional teaching methods.
	Hornik	El Salvador	S	Cognitive Skills ^P	+			r = .07 and .52 for gains with and without ITV.
	Klees	Mexico	S	Math, Language & Chemistry	+			Students exposed to TV instruction showed higher gains than traditional instruction.
	Okunrotifa	Nigeria	S	Geography	+			Post-test of experimental and control groups show significant differences in favor of programmed instruction (p < .01), even with pre-test controlled.
13. <u>Teacher Absenteeism and Punctuality</u>								
	Fuller & Chantavanich	Thailand	P	Math & Thai		0		Contributed virtually nothing to variance explained in the national regression equation; $\beta = .012$, NS.
	Izquierdo & Guzman	Mexico	P	Math & Lang		0		r = .077, NS

^P General ability and reading tests, achievement in three subjects: math, social studies and science.

ANNEX TABLE IV (continued, p. 15)

Independent Variable	Author(s)	Country	School Level ^a	Criterion Variable	Relationship			Comments
					+	0	-	
15. Teaching Behavior (continued)								
	Comber & Keeves	India	Pop II	Science Ach	+			r = .31, p < .01
		India	Pop IV	Science Ach	+			
		Iran	Pop IV	Science Ach		0		r = .14, NS
<u>IEA Between-Student Comparisons</u>								
	Comber & Keeves	Chile	Pop I	Science Ach		0		r = .04, NS
		Chile	Pop II	Science Ach		0		r = .02, NS
		Chile	Pop IV	Science Ach	+			r = .13, p < .01
		India	Pop I	Science Ach		0		r = .05, p < .01
		India	Pop II	Science Ach	+			r = .12, p < .01
		India	Pop IV	Science Ach	+			r = .31, p < .01
		Iran	Pop I	Science Ach		0		r = .02, NS
		Iran	Pop II	Science Ach	+			r = .12, p < .01
		Iran	Pop IV	Science Ach		0		r = .00, NS
		Thailand	Pop II	Science Ach	+			r = .24, p < .01

ANNEX TABLE IV (continued, p. 19)

Independent Variable	Author(s)	Country	School Level ^a	Criterion Variable	Relationship			Comments
					+	0	-	
16. School-Teacher IEA Block (continued):								
<u>IEA Between-Student Comparisons</u>								
	Carroll	Chile	Pop IV	French Listening	+			32.5% of variance explained by School-Teacher Block, compared to 14.6% by Background Block.
	Comber & Keeves	Chile	Pop I	Science Ach	+			9% of variance explained by School-Teacher Block, compared to 4% by Background Block.
		Chile	Pop II	Science Ach			0	
		Chile	Pop IV	Science Ach			0	8% of variance explained by School-Teacher Block, compared to 19% by Background Block.
		India	Pop I	Science Ach	+			20% of variance explained by School-Teacher Block, compared to 1% by Background Block.
		India	Pop II	Science Ach	+			8% of variance explained by School-Teacher Block, compared to 3% by Background Block.
		India	Pop IV	Science Ach	+			17% of variance explained by School-Teacher Block, compared to 4% by Background Block.

ANNEX TABLE IV (continued, p. 23)

Independent Variable	Author(s)	Country	School Level	Criterion Variable	Relationship			Comments
					+	0	-	
16. School-Teacher IEA Block (continued):			<u>IEA Between-School Comparisons</u>					
	Shukla	India	Pop II	Science Ach	+			20.8% of variance explained by School-Teacher Block, compared to 10.9% ave. for developed countries.
		India	Pop II	Reading	+			11.4% of variance explained by School-Teacher Block, compared to 3.4% ave. for developed countries.
		India	Pop IV	Science Ach	+			44.8% of variance explained by School-Teacher Block, compared to 15.6% ave. for developed countries.
		India	Pop IV	Reading		0		11.4% of variance explained by School-Teacher Block, compared to 11.6% ave. for developed countries.
		<u>IEA Between-Student Comparisons</u>						
		India	Pop I	Science Ach	+			19.8% of variance explained by School-Teacher Block, compared to 6.7% ave. for developed countries.
		India	Pop I	Reading	+			14.9% of variance explained by School-Teacher Block, compared to 3.9% ave. for developed countries.

ANNEX TABLE IV (continued, p. 24)

Independent Variable	Author(s)	Country	School Level ^a	Criterion Variable	Relationship			Comments
					+	0	-	
16. <u>School-Teacher IEA Block (continued):</u>			<u>IEA Between-Student Comparisons</u>					
	Shukla	India	Pop II	Science Ach		0		8.1% of variance explained by School-Teacher Block, compared to 8.4% ave. for developed countries.
		India	Pop II	Reading	+			9.7% of variance explained by School-Teacher Block, compared to 4.3% ave. for developed countries.
		India	Pop IV	Science Ach	+			17.1% of variance explained by School-Teacher Block, compared to 15.7% ave. for developed countries.
		India	Pop IV	Reading	+			4.7% of variance explained by School-Teacher Block, compared to 4.6% ave. for developed countries.

ANNEX TABLE V

SUMMARY OF RELATIONSHIPS FOR EACH TEACHER AVAILABLE

		Direction of Relationship			
		+	0	-	
I. DEMOGRAPHIC AND BACKGROUND VARIABLES					
1.	<u>Teacher Sex</u> (M=1, F=2)	Regular studies IEA studies	2 7	1 5	2 10
2.	<u>Teacher Age</u>		3	2	-
3.	<u>Teacher SES</u>		2	1	-
4.	<u>Frequency of English in Childhood Home</u>		-	1	-
II. TEACHER QUALIFICATION VARIABLES					
5.	<u>Teacher Educational Attainment</u>	Regular studies IEA studies	2 2	6 1	- -
6.	<u>Teacher Credentials and Certification</u>	Regular studies IEA studies	9 4	6 3	1 1
7.	<u>Teacher Ability and Achievement</u>	Regular studies IEA studies	2 3	3 -	- 1
8.	<u>Teacher Experience</u>	Regular studies IEA studies	7 -	1 1	2 1
9.	<u>Teacher Salary</u>		3	1	-
10.	<u>Teacher Upgrading</u>		3	-	-
III. TEACHER BEHAVIOR AND ATTITUDES					
11.	<u>Teacher Expectations of Students</u>		4	-	-
12.	<u>Teaching Methods</u> (ITV, programmed instruction, etc.)		4	-	-
13.	<u>Teacher Absenteeism and Punctuality</u>		-	2	-
14.	<u>Teacher Attitude Toward Job</u>		2	3	-
15.	<u>Teacher Behavior:</u> Homework Assignment Lesson Preparation		7 3	8 1	- 1
16.	<u>IEA School-Teacher Block Analyses:</u>	Science Literature Reading French English as Foreign Language	17 1 17 2 4	7 6 6 -	

SAMPLE AND LEVEL OF ANALYSIS FOR TEACHER STUDIES (p. 1)

Author(s)	Country	Sample		Level of Analysis	
		Primary	Secondary		
Beebout (1972)	Malaysia		7,674 students in grades 10 and 11 in 89 schools, stratified by state and language. Data from exam records and headmaster questionnaires.	Between-student with teacher and community data aggregated by school.	
Bibby & Peil (1974)	Ghana		585 students in 5th Form from 11 schools.	Between-student	
Carnoy (1971)	Puerto Rico	1967 School Survey data, N=182,000 male students from grades 3, 6, 9, and 12. Teacher and school data taken from school records.		Between-student with teacher and school data aggregated at school level.	
Carroll (IEA, 1975)	Chile		Pop IV, final year in high school. 60 schools and 1529 students.	Between-student and between-school with aggregated teacher data.	
Comber & Keeves (IEA, 1973)	Chile India Iran Thailand	Chile: Pop I: 81 schools and 1470 students. Pop II: 103 schools and 1311 students. Pop IV: 73 schools and 2052 students.	India: Pop I: 176 schools and 2704 students. Pop II: 155 schools and 2931 students. Pop IV: 124 schools and 3153 students.	Iran: Pop I: 53 schools and 1640 students. Pop II: 33 schools and 1336 students. Pop IV: 34 schools and 1435 students.	Between-student and between-school with aggregated teacher data.
		Thailand: Pop I: 31 schools and 1810 students. Pop II: 29 schools and 1932 students. Pop IV: 13 schools and 724 students.			

ANNEX TABLE VI (continued, p. 2)

Author(s)	Country	Sample		Level of Analysis
		Primary	Secondary	
Currie (1977)	Uganda		Questionnaires to all school graduates of 1954, 1959, 1964, and 1969. 41% response rate; male sample = 463.	Between-student with teacher proxy by quality of school variable.
Durojaiye (1973)	Uganda		540 students from Standards I, II, and III in rural and urban secondary schools.	Between-student
Ellson (1973)	Malaysia	10 each of the highest and lowest students from 10 schools for control and experimental groups (N for each group = 98). 10 each of trained and untrained teachers; one teacher per 10 students.		Between-student
Farrell & Schiefelbein (1974)	Chile	10 students and 7 teachers from grade 8 classes (in both primary and secondary schools); N for classes = 353.		Between-student; teacher data aggregated for each class.
Fuller & Chantavanich (1976)	Thailand	Stratified random sample of 23,555 grade 3 students and 987 teachers.		Between-student; aggregated teacher data by school.
Heyneman (1976 a, b, c)	Uganda	67 primary schools in 5 regions, 2,293 grade 7 pupils and 598 teachers.		Between-school

ANNEX TABLE VI (continued, p. 3)

Author(s)	Country	Sample		Level of Analysis
		Primary	Secondary	
Hornik (1973, (1975)	El Salvador		26 classes who began 7th grade in 1970 and 9th in 1972; 15 classes used ITV (student N not reported).	Between-class
Husén (1977)	Botswana		Two-stage stratified random sample of 37 primary schools, 869 Standard 7 students, 562 teachers.	Between-student with individual teacher data linked with student.
Izquierdo & Guzman (1971)	Mexico	519 students in grades 3, 4, and 5; 60 teachers.		Between-student; not clear on teacher data.
Klees (1974)	Mexico		1236 students in 58 classes with Telesecundaria; 1101 students in 23 classes without.	Between-student with teacher data aggregate by class.
Lewis & Massad (IEA, 1975)	Chile Thailand	Thailand: Pop II: 40 schools and 1957 students. Pop IV: 15 schools and 936 students. Chile: Pop IV: 80 schools and 2314 students.		Between-student
Levy (1971)	42 LDCs	Published and unpublished government and international agency reports on retention rates for primary school. No figures reported.		Between-country

ANNEX TABLE VI (continued, p. 4)

Author(s)	Country	Sample		Level of Analysis
		Primary	Secondary	
Nasoetion, <u>et al.</u> (1976)	Indonesia	Experimental and control grade 5 classes for new and old textbook and with and without upgraded teachers (8 classes in each cell); schools chosen randomly.		Between-student
Okunrotifa (1975)	Nigeria	Experimental and control grade 8 classes.		Between-class
Philippines Dept. of Educ. & Culture (1976)	Philippines	Stratified random sample of 586 schools, with 28,915 6th grade pupils, and 2,930 5th grade pupils. Teacher N = 5,123.		Between-student with teacher class data linked with indiv. student.
Purves (IEA, 1973)	Same as for Comber & Keeves			
Rowe (1966)	Hong Kong	The lowest 20 Primary IV students from 5 schools (N = 100) and top 10 students from same schools.		Between-student
Ryan (1974)	Iran	66 schools and 797 grade 2 students, 66 teachers, in 3 governorships.		Between-student

ANNEX TABLE VI (continued, p. 5)

Author(s)	Country	Sample		Level of Analysis
		Primary	Secondary	
Schmelkes (1972)	Mexico	Representative stratified sample of 24 schools and 161 students from grades 1-4.		Between-grade
Shukla (1974)	India	Secondary analysis of data reported by Comber & Keeves and Thorndike; Pop I, II, and IV for Science and Reading IEA.		Between-student and between-school
Silvey (1972)	Uganda		211 final year secondary students for whom both junior exam and final year exam scores were available.	Between-student
Somerset (1968)	Uganda		All 1964 candidates for the CSC who sat Junior Secondary Leaving Exams. Student N = 881.	Between-student
Thias & Carnoy (1972)	Kenya	Random sample of 89 rural schools, Student N = 3,405 from grade 7 who had taken the Kenya Preliminary Exam.		Between-school
			All students who took the Cambridge School Certificate exam (after Form IV, i.e., grade 11) in 115 rural and urban schools.	Between-school

ANNEX TABLE VI (continued, p. 6)

Author(s)	Country	Sample		Level of Analysis
		Primary	Secondary	
Thorndike (IEA, 1973)	Chile India Iran	Same as for Comber & Keeves		
Williams (1965)	Guatemala	Official retention records for all students in primary grades 1-3.		Between-student and between-region
Windham (1970)	Sierra Leone		116 students from Forms 3 and 5 in a government and a missionary school.	Between-school
Youdi (1970)	Congo		1450 students from Forms 5 and 6 in 25 schools.	Between-student with aggregated teacher and school variables.

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Developing Countries:
What Investments Boost Learning?*

Bruce Fuller
September 1985

Education and Training Department

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Abstract

Low levels of student achievement and school quality persist within developing countries. This paper reviews evidence on the importance of school quality -- in raising literacy and influencing economic development. In addition, much has been learned about how to raise the quality and efficiency of schools. Major lessons are discussed within four areas.

School quality and development. First, evidence is now clear that low school quality largely accounts for low levels of literacy and achievement among Third World children. After controlling for the effects of the child's preschool background and economic context, school quality makes a substantial difference in developing countries. Yet persistently low levels of school quality are constraining economic returns to educational investments. In addition, initial evidence shows that little progress has occurred in improving school quality among the poorest developing nations since 1970. Just as the potential force of school quality has become clearer, erosion of already limited levels of quality is accelerating.

Defining school quality. Second, a clearer definition of "school quality" would help refine investment strategies of governments and development agencies. School quality is often indicated by levels of student achievement (output) or by school characteristics which are unrelated to pupil performance. Instead, investments should be consistently targeted (a) on school characteristics which influence achievement, and (b) on efforts which encourage more efficient management and organization of material inputs by local school staff.

Improving school quality. Third, much has been learned about what elements of schools consistently boost literacy levels. The major lesson of 72 empirical studies are reviewed here. Those inputs most strongly linked to the instructional process -- textbooks, writing materials, and teacher quality -- consistently influence achievement. Cost savings can be realized by reducing investment in other elements which are not related to achievement, including small class size, classroom laboratories, the paper credentials of teachers, and teacher salary levels. Very little research has occurred regarding the influence of teaching practices and classroom organization on achievement within developing countries. These management practices might more effectively raise literacy and academic achievement than via new investments in material inputs.

Boosting school efficiency. Fourth, only a modicum of thinking has occurred on the relative cost-effectiveness (or internal efficiency) of alternative school inputs and management practices in raising achievement. This paper does identify elements of schools which are not related to higher student achievement, for which investment can be reduced without detrimental achievement effects. But among those elements which consistently do influence performance, little is known about their magnitude of effect and their relative costs. Methods for studying the efficiency of various inputs are reviewed here.

Summary

"A year of schooling is not just a year of schooling. It can be anything from a delight to a torment depending on the imagination and devotion, as well as the cognitive skills, of the teacher. It can be anything from an experience of growth and mastery to a stunting and confining time [Note 1.1]."

The efficacy of many Third World schools — even in providing basic literacy skills — remains limited. Students in developing countries learn much less than pupils within industrialized nations, even when they have attended school for the same number of years. Disappointing levels of student performance, in large part, can be attributed to low school quality. And signs of dismal school quality are common in most Third World nations: a scarcity of reading materials, poorly trained teachers, classrooms with no tables on which to write, instructional programs which fail to enliven children's curiosity.

This paper reviews major findings from the past 15 years of research on school quality in developing countries. Two specific tasks are undertaken. The problem of low school quality is described in detail. Then, past empirical research is reviewed on which specific elements of schools are most consistently related to student achievement. Lessons from this work could help refine investment strategy aimed at improving the effectiveness and efficiency of schools.

How serious is the school quality problem? Strong evidence now shows that school quality contributes to higher student achievement in developing countries, controlling for effects of the child's preschool background and economic setting. Earlier work demonstrating that material resources make little difference in shaping pupil performance within industrialized nations does not hold within most Third World settings. Unfortunately school quality remains low, even at the primary level, within most developing countries.

Early evidence suggests that low school quality is seriously constraining the economic return to school investments — both for individuals and for national economies. Initial analyses also suggest that a tradeoff faces governments and development agencies between further expanding school enrollments versus improving school quality. School quality (indicated by per pupil expenditures) has suffered most in those developing countries which have expanded enrollments rapidly in the past decade. No progress in improving school quality is evident in the poorest developing countries since 1970. The gap in school quality between low-income and middle-income Third World countries also has widened during this period. Middle-income countries have made significant progress in raising per pupil expenditures and in supporting more teachers relative to enrollments.

How can school quality be more clearly defined? Vague definitions of "school quality" are contributing to imprecise strategies for improving student achievement. Governments and development agencies often define quality in terms of the level of academic performance or retention in school. But the quality of the school's impact cannot be inferred exclusively from the quality of student performance (i.e. output). This fails to account for factors outside the school which independently influence performance (including family income, early childhood socialization, and ongoing demand for the child's labor). Alternatively, quality is often defined in terms of the aggregate level of all inputs; this fails to discriminate between those school characteristics which lead to higher achievement from those that do not.

School quality is better defined in relation to the amount of learning imparted by the school after accounting for the effects factors which operate external to the school, such as the child's economic context and preschool background. Two sets of school characteristics are involved in the "value-added" to the child's academic skills or the increment of learning directly by the school: (1) The concentration of material inputs per pupil allocated to the school (e.g., textbooks, desks, pencils and paper), and (2) the social organization or management of these physical factors (e.g., the organization of instructional lessons, the headmaster's management competence, or the character of interaction between teacher and student). The second set of factors largely determines the efficiency with which material inputs are organized to influence achievement levels. The level of material resources available per student connotes a certain level of quality. However, schools with scarce resources vary dramatically in their level of efficiency and organizational proficiency in boosting learning. Similarly, schools with abundant material resources may utilize material resources inefficiently, failing to raise student achievement significantly.

What school quality investments raise achievement? Investments are currently made in a variety of school inputs and management practices, independent of each factor's actual relationship to student achievement. Yet a considerable body of empirical research has developed in the Third World over the past 15 years. One must first distinguish between those elements of school quality which are related to higher achievement from those which are not. This paper reviews findings of 72 empirical studies completed over the past decade and a half. In general, those school elements closely linked to the instructional process -- books, libraries, writing materials, and teacher quality -- most consistently influence student achievement. Investment strategies could also benefit from knowledge of those school quality elements which hold no consistent influence on achievement (e.g., small class size, use of laboratories, or individual teacher salary rates), identifying where substantial cost-savings can be generated.

Early research suggests that teaching practices also influence pupil performance in the Third World. Despite extensive work in this area within industrialized nations, little research has occurred within developing countries. Attempts to identify those material factors related to achievement have eclipsed efforts to understand how the local management and social organization of material inputs increase pupil performance.

What school quality investments increase the school's efficiency? Very little is known about the relative costs of alternative elements of school quality -- even within that set of school characteristics which consistently raise achievement. This area of ignorance limits our ability to answer the question, **What elements of school quality are the most cost-effective in raising student achievement?** Here the concern is not only whether a specific ingredient of quality is effective in raising achievement. But improving schools' efficiency involves two additional questions. First, what is the magnitude of the school factor's achievement effect? Second, what is the cost of this strategy to improve quality relative to another factors? For instance, inservice training of teachers may effectively boost achievement. But investing in additional textbooks or instructional materials may yield a larger achievement effect at an equal or lower cost, compared to the magnitude of the effect or cost of teacher training. Methods for determining the relative efficiency (in raising achievement) of different elements of quality are reviewed here.

The search for more efficient investment strategies should perhaps stop at middle-range decision rules, focusing on those elements of quality which are related to achievement and specifying the conditions under which these positive effects are likely to occur. Studies of cost-effectiveness or efficiency of different school elements should not assume an unrealistic level of precision in policy and investment implementation. Nor should the desire to determine precise costs of material elements of school quality distract attention from a clearer understanding of teaching practices and school management skills -- social factors for which determination of marginal costs is difficult. Changing teaching behaviors is conceptually simple and potentially inexpensive; yet determining how to improve classroom practices is problematic. Governments and development agencies could provide clearer information to local schools on how to improve teaching practices and how to create more motivating classrooms.

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Bruce Fuller

Chapter 1

The Issue: A Costly Neglect of School Quality?

Introduction

Education's contribution to national development has been widely recognized in the Third World since World War II. Government policymakers and development groups have emphasized the importance of boosting the quantity of education. Expanding schools yields clear signals of social and economic progress: Building more school structures, hiring more teachers, and enrolling more children offer concrete signs of change. Yet the quality of teaching and learning that occurs within this burgeoning number of schools is highly variable and very low in many developing countries. Several recent events prompt rising concern over inadequate school quality.

First, the issue of quality has been eclipsed by the Third World's post-war desire to simply build national systems of education. Until primary enrollment rates reached reasonably high levels, improvement of quality was not viewed as the immediate problem. Nations which have expanded primary schooling are now faced with a tradeoff between improving quality of primary instruction or further expanding secondary and tertiary schools.

Second, the recent decline in the level of investment capital available to the Third World prompts an overdue question: How can schools more efficiently increase literacy and academic achievement? When school systems are rapidly expanding, policymakers and local school staff may spend less time thinking about which elements of schools effectively boost student achievement. But the slowing of growth in resources and enrollment rates provides the opportunity to focus attention on improving the effectiveness of schools. This is not to say that improving school quality is less costly than continued school expansion. Recent research does, however, disentangle those elements of school organizations which are consistently related to higher student achievement from those factors which are not. Shifting resources from the latter to the former elements of schooling could raise efficiency at no additional net cost to the education sector.

Third, our knowledge about student achievement in the Third World and the antecedent influence of school quality has grown substantially in recent years. As attention of policymakers and researchers turns from school expansion to school improvement, the problem of inadequate quality becomes more stark. Four aspects of the school quality problem have been illuminated by recent research:

- o Literacy and academic achievement of children in developing countries remains far below the performance of students within industrialized countries at the same grade level.

o Low levels of student achievement and poor school quality are constraining the influence of school investments on subsequent economic development. Initial evidence demonstrates higher economic returns to school investments when school quality and/or student achievement are at relatively high levels in developing countries. These economic effects of school quality operate independently of school quantity (that is, either the individual's length of schooling or the nation's enrollment rate). These potential economic benefits, however, are seriously constrained in many settings due to low quality.

o The absence of a clear investment priority between improving the quality of primary schooling versus expansion of secondary and tertiary schooling may be very costly. The evidence is clear that rates of return to primary schooling are higher than returns to secondary and higher education in most Third World countries. Improving the quality of primary schools may spur economic development more strongly than expansion of higher levels of schooling.

o Initial evidence reveals that school quality has declined in the poorest Third World nations since 1970. In addition, the gap in relative levels of school quality between developing and industrialized countries has widened over the past 15 years.

This chapter speaks in turn to each of these aspects of the school quality problem.

Issue 1: Low Student Achievement, Low School Quality

Only ten percent of Third World students, age 14, are as literate in their native language compared to youth from industrialized nations. This was a major finding of one cross-national study of school achievement. Mean exam scores in reading, math, and science were 50 percent lower within developing countries compared to industrialized nations. In reading, for instance, the mean comprehension score (in native language) equalled 26 for all countries surveyed. The mean reading score, however, for Chile equalled only 14; for Iran, 8; and in India, 5. All youth given the exam were age 14 and all were enrolled in school at the time. This research included only four developing countries (Chile, India, Thailand, and Iran). But the findings may accurately represent low levels of student achievement evident in most other Third World nations. For example, in Sierra Leone only 15 percent of all Grade 2 students are achieving in math at the expected grade level. And by international standards, achievement may be higher in the four developing countries included in this cross-national study relative to lower-income Third World states.

Alternative measures of student performance yield equally discouraging signs regarding student performance in the Third World. In Bangladesh, only one-fourth of all children complete the fourth grade. In Peru, 37 percent of all children repeat the first grade. Even among the four less poor developing countries mentioned above -- Chile, Thailand, Iran, and India -- the number of Grade 4 children was one-half the size of Grade 1 enrollments [Note 1.2].

Variation in student performance is very wide within developing

countries. In Egypt, rural primary school students perform one grade level below urban children. Reading scores among low achieving schools in Botswana average one-third the achievement level observed in high performing schools. Similarly, in Kenya, rural school performance on the national exam ranges as low as one-third below the mean performance of urban schools (between-school mean scores). Urban Brazilian youth, age 12-15, on average have completed four years of schooling; yet rural youth have completed just one and one-half years of schooling. Each day, 15 percent of all urban Peruvian students and 30 percent of rural children reportedly are absent from school [1.3].

The cost implications of frequent repetition of a grade-level and high dropout rates are enormous. An example of this inefficiency is clearly apparent in Haiti. Due to a high repetition rate and low persistence among rural Haitian children, over 20 student-years of school attendance are observed. [Five pupils each attending school for two years equals 10 student-years of attendance.] In Haiti's urban private schools, just seven student-years of attendance occur per graduate (for a six year course of study) [1.4].

Table 1 reports on the percent of pupils completing primary school for developing and industrialized nations. These data do not capture variation in student persistence within nations. But inequities by levels of national wealth and region are important to note. For instance, among the 23 low-income developing countries reporting data (GNP per capita less than US\$ 405) only 60 percent of all children complete primary school. This completion rate rises to 75 percent for middle-income developing nations (GNP per capita of \$840 for lower middle-income and \$2,490 for upper middle-income nations). Virtually all children of industrialized nations (GNP per capita equalling \$11,070) finish primary school. Student performance in sub-Saharan Africa remains acutely low on a variety of benchmarks. For example, adult literacy is below 20 percent in Chad and Mali.

Table 1
Student Performance: Primary School Completion Rates

	% Pupils Completing Primary School	Number of Countries Reporting
Development Status		
Low-income countries	60%	23
Middle-income countries	75%	49
Industrialized countries	93%	6
Developing Countries		
By Region		
Sub-Saharan Africa	65%	30
East Asia	84%	11
South Asia	66%	4
Latin America	65%	19

Source: Unesco (1983a)

Documenting low levels of student achievement in developing countries is straightforward. The task of explaining the antecedent causes of low performance is more difficult. Looking across nations, relative levels of wealth are clearly related to students' average achievement levels [1.5]. A nation's wealth boosts achievement through at least two mechanisms. First, infants and young children in more affluent countries experience a higher quality of life, especially in terms of nutrition, physical health, and cognitive stimulation. Therefore, children in wealthier nations enter the primary school with stronger physical and intellectual competencies. Second, the demand for children's labor is much lower within more industrialized nations. These societies, in fact, often have enacted strong institutional rules which constrain children's entry to jobs. In contrast, within developing countries many children are required to work in agriculture or urban jobs for a good part of each day and especially during planting and harvest seasons.

Unequal levels of preschool development and labor demand for children also exist within developing nations. Several studies from the Third World find that the pupil's social class background does make a difference in shaping school achievement. However, the influence of the child's social class appears to be less overall and less consistent in developing countries, compared to industrialized nations [1.6].

Quality of the child's school also makes a substantial difference in determining achievement in the Third World. A decade ago the dominant speculation was that, like industrialized countries, students' social class and surrounding community wealth eclipsed any potential influence of the school itself. This is indeed the case for more industrialized nations, at least to the extent that the correct school characteristics have been studied. When one looked across nations, the society's wealth was (and remains) a powerful determinant of a nation's average level of achievement. But research over the past decade consistently shows that school quality strongly shapes student achievement within developing countries. In addition, the influence of school quality on student achievement is strongest among poorer countries and among lower income students within developing nations. And at times, school quality actually influences school achievement more strongly than does social class. Interestingly school quality is a stronger (and family background a weaker) determinant of achievement in curriculum areas which are not linked to indigenous language or knowledge, such as achievement in mathematics or science [1.7].

Chapter 2 reviews in depth the evidence on whether aggregate levels of school quality influence achievement and which elements of quality most efficaciously raise pupil performance. Part of the problem is that research which demonstrates the importance of school quality has not permeated policy circles within many countries and development groups.

Evidence which links school quality to student achievement is encouraging. This research emphasizes that the school institution can influence literacy levels and human capital formation somewhat independent of material economic conditions -- providing an important policy and investment lever. Unfortunately school quality is very low in many developing countries. And signs of low school quality are abundant. In Malawi, only one in eight children attending school has a seat. Just one

in 88 students is provided a desk on which to write. The ratio of pupils to teachers is as high as 55/1 in Togo and 51/1 in Cameroon. Prior to a large development program, schools in the Philippines had one textbook for every 10 pupils. Shortages of books and basic reading materials are common. Sierra Leone spends US\$ 0.68 per student on instructional materials; Bolivia allocates \$ 0.80 for textbooks and classroom supplies [1.8].

Large inequities in school quality are apparent across nations, particularly in terms of basic material resources available per student. Table 2 (Column A) reports expenditures per pupil for developing and industrialized countries and by region for 1980. Among nations reporting data, low-income nations spend just US\$ 59 per student versus \$195 for middle-income developing countries. Industrialized nations spend \$2,297 per pupil. The picture is quite similar for per pupil resources allocated for (non-salary) instructional materials (Column B). Low-income countries spend on average \$1.69 per pupil versus \$92.32 among industrialized nations. These first two indicators of school quality are empirically related to student achievement (see Chapter 2). Expenditure data have not been adjusted for cross-national differences in purchasing power given the lack of indices available for individual developing countries. However, based on existing purchasing power information, the unequal quality levels seen here would be compressed modestly if complete purchasing-power adjustments could be made [1.9].

Table 2
School Quality Indicators for Primary School Level, 1980
(Number of Countries Reporting)

Nation Groups	(a) Total Recurrent Expenditures Per Pupil (1980 US \$)	(b) Expenditures on Instructional Materials Per Pupil (1980 US \$)	(c) Pupil/Teacher Ratio
Development Status			
Low-income Countries	\$ 59 (21)	\$ 1.69 (34)	44 (34)
Middle-income countries	\$ 195 (42)	\$ 6.14 (32)	32 (59)
Industrialized countries	\$2,297 (19)	\$92.32 (16)	18 (18)
Developing Countries Only by Region			
Sub-Sahara Africa	\$ 92 (24)	\$ 2.49 (16)	43 (36)
Middle East & North Africa	\$ 221 (5)	\$ 3.28 (4)	30 (10)
East Asia & Pacific	\$ 210 (6)	\$ 2.06 (6)	31 (12)
South Asia	\$ 17 (6)	\$ 1.26 (4)	40 (9)
Latin America & Caribbean	\$ 209 (19)	\$ 8.99 (15)	30 (24)

Sources: Unesco (1981, 1983a, 1983b)

Variation in school quality is also apparent across geographical regions among developing countries. The six south Asian countries reporting data for 1980 spend a total of just \$17 per student and \$1.26 per pupil for instructional materials. On the other hand, Latin American nations allocate \$209 per student and \$8.99 on instructional materials.

The ratio of pupils per teacher represents a third measure of quality, representing the concentration of one material input per student. The

unequal distribution of material inputs is also observed here. The pupil/teacher ratio is 44/1 in low-income nations, versus 32/1 in middle-income and 18/1 within industrialized states (Column C). Geographical variation is also seen here, with the highest pupil/teacher ratios reported in sub-Saharan Africa (43/1) and South Asia (40/1).

As seen above in achievement patterns, inequities in school quality also are apparent within developing nations. In Honduras, for instance, about one-third of all rural teachers work in a one-room schoolhouse with 60 children. The pupil/teacher ratio in Tanzania ranges from 60/1 to 31/1 among rural and urban regions, respectively. In northeastern Brazil, one-third of all teachers have four years of schooling or less, and 75 percent do not meet minimum national qualifications. In El Salvador, 55 percent of all rural students have no books available in their schools.

Ideally, better cross-national measures of school quality would be available. Expenditures per pupil are general indicators which fail to capture variation in how resources are spent, particularly as distributed among administrative costs, teacher salaries, and instructional materials. This indicator, however, is empirically related to student achievement in a majority of studies completed (Chapter 3). Yet the pupil/teacher ratio reported by Unesco does not take into account multiple shifts of classes. It simply reports the national ratio of enrollments to teachers. The benchmark may reflect average class size; but class size is not always related to achievement levels. More work is needed in developing cross-national indicators of school quality.

Issue 2: Constraining the Economic Return to School Investments

The economic cost of low school quality is sizable. Research on the material effects of school quality is quite young. Yet initial evidence suggests that variability in quality is related to economic gains both in terms of individual income and national economic development. Importantly, the economic effects of investing in school quality occur independently of school quantity. Not surprisingly, how much the child learns appears to significantly influence future earnings, beyond how many years the child attends school. Therefore, unless a priority is placed on improving quality, the economic benefits of increasing school investments will be constrained.

Research on the economic benefits of school quality has followed two streams. First, research has looked at the influence of school quality on the individual's subsequent success in the labor force. That is, children attend schools of varying quality and learn differing amounts of knowledge or skills. This variation among individuals may influence the level of job attained in the labor force and subsequent personal earnings. For example, one longitudinal study followed 1,205 Chilean youth through school and into their first jobs. All youth surveyed had completed primary school in 1970. Their family background and the quality of school attended each helped to explain the level of their first occupation. School quality was measured through several indicators, including teachers' educational level, textbook availability, and the quality of school facilities [1.10].

Several studies within industrialized nations find that school quality (measured in terms of expenditures per pupil) significantly affects earnings of school graduates. Early work on estimating economic returns to education used global measures of school quantity, such as the length of school attendance. Similar to the findings for academic achievement, family background has been found to dwarf any effect of the youth's amount of schooling on subsequent earnings. Yet this more recent work reveals larger income effects for schooling when discriminating between varying levels of quality within industrialized nations.

School quality may be more efficacious in shaping individual earnings within developing countries. For instance, a recent study of 6,171 Brazilian males, age 15-35, found that the quality of school attended (in terms of mean educational level of teachers) influenced subsequent earnings more strongly than the length of schooling completed. Quality along this benchmark was low and highly variable. Teachers on average had attained less than nine years of schooling. Variation in their level of schooling was quite wide; two-thirds of the teachers had received between five and twelve years of formal education. The Brazil study suggests that the economic return to school quantity may be commonly over-stated unless one accounts for differences in school quality across regions and individual schools. For example, the social rate of return to greater investment in school quality exceeded the yield associated with increasing the number of years of school attendance (even after accounting for the additional cost of educating teachers for a longer period of time). In addition, the rate of return on improving quality also exceeded the ten percent rate-of-return standard commonly used in judging investment strategies [1.11].

Whether governments can actually reap such levels of return is another question. School quality differences are often bounded by economic and institutional structures. For example, many developing nations have not addressed inequities in school quality levels found between urban and rural areas. One recent study found that children of white-collar workers gain nearly six times as much benefit from school expenditures (including support of school quantity and quality) as do children of farmers. In some developing countries, such as within francophone Africa, the distribution of educational benefits is ten to one. Additional benefits in school quality may further benefit only urban students unless institutionally entrenched inequities are reduced. Also the strong earnings benefit observed in Brazil may only occur when taking into account variation in income across urban and rural areas. But these encouraging rate-of-return findings assume that no geographical, informational, or institutional barriers hamper movement among sectors of the labor force, across geographical regions, and among job sectors within urban or rural regions [1.12].

These weaknesses are avoided in a recent study of income effects of actual school achievement among 205 workers in Kenya and 179 workers in Tanzania. All individuals were employed within the modern economic sector by formal firms, avoiding the criticism expressed above that institutional barriers may mitigate against income effects of school quality. Importantly, this study disentangled the length of schooling attained by workers from how much they learned while in school. Achievement was measured on standard literacy and numeracy exams. This is not a direct measure of school quality. Some degree of literacy may also be acquired

outside of formal schooling. But actual achievement levels reflect, in large part, on the school's quality and capacity to raise achievement, independent of the child's length of school attendance. The research group found small income effects from the length of schooling completed and from whether a school degree was actually obtained (regardless of actual achievement level). But returns to the level of literacy and numeracy achievement were substantial in both countries, and the benefits were observed for both manual and white-collar workers. A rough test of "ability" was also used to control for the effects of preschool cognitive skills (which explained little variation in subsequent earnings) [1.13].

A related study examined the influence of educational attainment and school quality on farmer productivity among 683 households in Nepal. This study has a strong advantage over prior research in that it used actual measures of productivity rather than assuming that wage levels act as a reliable proxy for the worker's productivity level. Agricultural productivity was not sensitive to variation in school quantity among farmers completing one to six years of schooling. However, farmers with seven or more years of schooling were significantly more productive than those with lower levels of school attainment, after controlling for the influence of physical production inputs (land and capital). This suggests the presence of a threshold level of achievement or school retention which is related to subsequent productivity gains.

Similar to the Kenya/Tanzania study, the Nepal research also obtained information on farmers' numeracy levels, linking the study to school quality and actual levels of achievement. Variation in farmers' numeracy was not related to overall productivity but did influence output of wheat, a recently introduced crop in Nepal. Sizable rates of return were found for higher levels of numeracy (based on the elasticity of the numeracy achievement effect and schooling costs). Importantly, this research focuses on the economic benefits of actual school achievement, not only the length of school attendance. This study design also suggests that school quality — already shown to correspond with student achievement — yields competitive economic benefits. In addition, these benefits are independent of and at least comparable to returns from school expansion [1.14].

A second stream of research is looking at whether nation-level investments in school quality influence total economic output over time. This research design also avoids the problem of using income proxies for productivity, since actual levels of output are assessed. At the individual level, a close correlation may be observed between the worker's level of schooling and his or her wage rate — even when a national economy is experiencing no growth in productivity. By looking at aggregate economic output and production inputs (including levels of investment in school expansion and school quality) the weaknesses of using individual-level data are avoided. In addition, returns to education may also vary as labor demand patterns change over time. Looking at the relationship between school investments and economic growth over historical periods can avoid the danger of inferring long term relationships from data collected at one point in time.

Yet here too, most nation-level historical research has examined the influence of school quantity (national expenditures, average school attainment, or length of schooling for different occupational groups).

However, one recent study of economic development in Mexico found positive economic output effects from investments in school quality (in terms of expenditures per pupil and primary student persistence rates) and from rising literacy. This study estimates the influence of school quality and literacy effects on economic output among Mexico's state for a 60 year period, controlling for variation in physical production inputs (land, labor, and capital). The influence of literacy, a general measure of school achievement, was strongest within the urban-based manufacturing sector [1.15].

Issue 3: Policy Tradeoff Between School Expansion and School Quality

This evidence suggests that the economic payoff to educational investment stems not only from school expansion; economic returns to improving school quality also are significant. And potential benefits of continued school expansion may be seriously constrained unless low school quality is also addressed. Many governments and development groups have not yet faced this tradeoff between further school expansion versus improvement in school quality.

Two studies have examined explicitly this tradeoff between quality and quantity. The Brazil study found that the social rate of return was greater for marginal improvements in quality (again, as measured by teachers' educational levels) compared to increasing the length (years) of school attendance. In addition, an individual income effect was discovered for the interaction between length of schooling (quantity) and school quality. These findings suggest that higher aggregate productivity can result from improving school quality for a constant number of students, rather than expanding enrollment or increasing the amount of schooling available for a constant number of youth. An illustration is offered by the researchers: Assume that (1) school places were provided to one-half the number of pupils actually enrolled, and (2) the resources saved were redirected to improvements in quality. The researchers then accounted for the costs of improving quality with, and income benefits stemming from, this alternative use of educational resources. They found that aggregate income would be 18 percent higher with this allocation pattern than if all pupils below the mean length of school attendance (three years) were brought up to this level at the current level of school quality [1.16].

A second study looked at the possible causes of wide variation in school quality found among developing countries. One question within the investigation: Do nations with higher enrollment rates and higher rates of enrollment growth have lower levels of school quality? Two indicators of school quality were used for this cross-national analysis, per pupil expenditures and the ratio of pupils to teachers. Looking across all nations, countries with higher primary school enrollment rates also have higher quality schools. However, after controlling for differences in national wealth, developing countries with higher enrollment rates actually have lower school quality in terms of expenditures per pupil. And over the 1970-1980 period, expenditures per pupil declined in those countries with the highest growth in enrollment rates. The concentration of resources per student simply failed to keep pace with the rising number of students. These findings did not hold when using the pupil/teacher ratio as a measure

of quality. This evidence further points to a discrete tradeoff between school expansion and improvement of school quality [1.17].

The tradeoff between school quantity and quality becomes more significant in light of higher rates of return to primary schooling. Table 3 indicates that in some regions the social rate of return from primary schooling is twice the yield on investment in higher education, due to the latter's much higher costs and limited income benefits for most societies. Rates of return to larger investments in secondary school also fall consistently below social income gains provided by primary schooling. Further, social rates of return are inversely related to national wealth. That is, the highest rates of return to schooling are observed in lower-income developing countries. This is largely due to more acute shortages of literate and skilled workers in poorer nations. Given these diminishing rates of return (a) from the quantity of secondary and tertiary schooling and (b) from school expansion in general among middle-income developing countries, a stronger emphasis on improving quality may be advisable. Given the recent research, improvement in quality may offer rates of return which are more comparable to the yield on school investments observed during early periods of school expansion.

Table 3
Social Rates of Return to Education (Length of Attendance)

Region or Development Status	Level of Schooling		
	Primary	Secondary	Tertiary
Low-income countries			
Africa	28%	17%	13%
Asia	27	15	13
Latin America	26	18	16
Middle-income Countries			
Industrialized Countries	13	10	8
	—	11	9

Source: Psacharopoulos (1985)

In sum, more research is necessary to achieve consistent estimates of the economic benefits of school quality and to specify the prerequisite conditions under which these returns will be felt. Yet this early research consistently suggests that the quality of schooling and how much is actually learned by students significantly contribute to productivity and income growth. Education's contribution to economic development has been implicitly thought about in terms of school quantity. This growing line of research suggests that school quality exerts an independent and (at least) a comparable influence on economic development.

Until significant improvement in school quality occurs, the economic impact of additional school investments will be constrained. An emphasis on school expansion may yield diminishing economic returns by ignoring the independent influence of quality and by failing to take advantage of the

potential interactive influence of accompanying improvements in quality. Initial empirical work also substantiates the intuitive feeling held by some policymakers that both allocation and benefit tradeoffs exist between school expansion and quality [1.18].

Issue 4: Eroding School Quality

Since World War II Third World governments and development agencies have emphasized school expansion, not improvement of school quality. This policy priority has shown dramatic results: In 1950, just 37 percent of all children in the relevant age cohort were enrolled in primary school among developing countries. This rate grew to 58 percent by 1970 and is estimated at 72 percent for 1985. Secondary enrollment rates similarly rose from 5 to 43 percent between 1950-1985. This level of school expansion is even more impressive when noting that the base number of children was increasing at about three percent annually over this period [1.19].

Yet little knowledge is available on the long term effects on school quality resulting from such high rates of expansion. Recent evidence does suggest that resources available to the education sector have been leveling while school expansion has continued. This may indicate a diminishing level of expenditures per student and a thinning quality of education. For instance, government expenditures as a percent of GNP fell from 21 to 18 percent during the 1970's among developing countries. And the average share of government budgets allocated to education slipped from 16 to 11 percent during this time [1.20]. It is possible that nations experiencing significant economic growth may have been able to maintain prior levels of per pupil expenditures even while enrollments were expanding.

Recent data on two school quality indicators -- per pupil expenditures and pupil/teacher ratios -- were examined to better understand recent trends. Table 4 reports changes in school quality between 1970-1980 for all countries reporting these data. Among low-income nations, expenditures per pupil dropped from (constant 1980 US) \$109 to \$75 over the 1970's. These figures convert expenditure data into constant US dollars for comparative purposes and adjust for country-specific inflation rates. Per pupil expenditures in middle-income developing nations increased from \$127 in 1970 to \$195 in 1980. Industrialized countries almost doubled their support per student in constant terms over the 1970's.

Table 4
 School Quality Trends for the Primary School Level
 by Development Status, 1970-1980
 (Number of Countries Reporting)

School Quality Indicator	Low-income Countries	Middle-income Countries	Industrialized Countries
Primary School Expenditures			
Per Pupil (Constant 1980 US\$)			
1970	\$109	\$127	\$1,205
1980	\$ 75	\$195	\$2,343
(n)	(11)	(33)	(17)
Pupil/Teacher Ratio			
1970	44	36	23
1980	45	31	18
(n)	(33)	(57)	(18)

Source: Unesco (1983b)

Similar trends are evident when looking at the ratio of pupils per teacher. Low-income countries showed no real change over the 1970-1980 period. Yet middle-income countries reduced this ratio from 36/1 in 1970 to 31/1 in 1980. A significant decline is also apparent among industrialized nations, falling from 23/1 to 18/1.

Recent trends in school quality among Third World nations are mixed. Middle-income developing countries have made progress in improving the concentration of resources applied to each student, even during a period of significant school expansion. But school quality is eroding in the poorest nations, those unable to expand student spaces and maintain prior resource levels for each pupil. And the already large gap in school quality between all developing countries and industrialized nations is widening.

One might argue that unit costs should go down as enrollments expand, given apparent economies of scale. However, note that middle-income developing countries have been able to raise simultaneously enrollment rates and expenditures per pupil. In addition, expenditures per pupil are positively related to higher student achievement levels. Therefore, alleged economies of scale may be false when falling unit costs depress school quality, pupil achievement, and subsequent economic returns to educational investments.

Summary

Knowledge about school quality has grown substantially in recent years. This experience and research has illuminated four salient components of the school quality problem:

- Low levels of academic achievement and correspondingly low quality among Third World students and schools, respectively;
- Constrained economic returns to investments in education due to an emphasis on school expansion and relatively little improvement in school quality;
- Inadequate policy attention to the tradeoff between further school expansion versus improvement of school quality; and
- A recent decline in school quality among the world's poorest nations and an increasing gap in quality between developing and industrialized countries.

These issues suggest the desirability of shifting policy attention and resources from further school expansion to improvements in quality. This shift is occurring within some Third World governments and development groups. For instance, prior to 1967 the World Bank invested education resources almost exclusively in school construction. By 1982, just 37 percent of the Bank's education capital went to construction. Improvement in school quality has become a major goal for the Bank. Between 1967-1982 the number of projects which included support of textbooks rose from three to 37; the number sponsoring curriculum improvements increased from three to 56. Yet in many countries and within numerous education development initiatives the emphasis remains on further school expansion [1.21].

Beyond the question of whether more resources should be allocated for school quality, lies the second-generation issue of how quality should be raised. Some qualities of schools may not be related to higher student achievement. Other elements of school quality are clearly linked to pupil performance. The remaining chapters focus on the task of clearly distinguishing between these two sets of school ingredients. First, I propose a more specific definition of "school quality" (Chapter 2). Second, research is reviewed on which specific elements of school quality most consistently influence student achievement (Chapter 3). The objective here is to identify how schools can be improved to more efficiently impart literacy and academic skills.

Before proceeding, I should note that the issue of whether education sector resources should be shifted from further expansion to improving quality will be set aside for the moment. The push to raise school quality and student achievement is founded, in part, on the assumption that school improvements can lead to the more efficient use of scarce educational resources. Higher levels of achievement presumably are possible even within static levels of material school inputs, particularly to the extent that quality and efficiency are linked to the management and social organization of inputs. Improvement in quality can also generate cost savings by spending less on those elements of schools which are unrelated

to student achievement. But this argument does not assume that serious improvement of school quality is a less costly project than the financing of further school expansion.

Three allocation decisions are involved in addressing low school quality: (1) The level of resources allocated to the entire education sector of a nation or development group, (2) the distribution of education sector resources between school expansion and improvement of quality, and (3) targeting investments on those elements of school quality that are most effective and efficient (taking into account variable costs) in boosting student achievement. More careful allocation of limited resources to those elements of school quality which most efficiently raise achievement (for instance, books and instructional materials) could raise the efficiency of schools. In addition, moving resources away from ingredients of schools which are unrelated to achievement (for example, small classes) will conserve resources. These issues fall within just the third allocation decision. The magnitude of benefits from carefully attacking low school quality are influenced at the first two points. Nevertheless, we assume that the pursuit of higher school quality can be accomplished independent of the first two policy decisions.

Chapter 2 Defining School Quality

Introduction

The term "school quality" often is evoked within developing countries. Low student achievement levels — manifest in low test scores, high dropout and grade repetition rates — often provoke greater concern with school quality. Here "quality" is defined in terms of output or achievement. The academic performance of children, however, stems from factors other than the character of their school. In addition, a diagnosis of the school quality problem that focuses on outputs (pupil performance) fails to inform us about the antecedent causes (inputs and practices). Investment strategy founded only upon general output indicators is less likely to address specific school factors which are actually related to school achievement. A clearer definition of "school quality" could sharpen how we conceptualize the problem and formulate investment strategies.

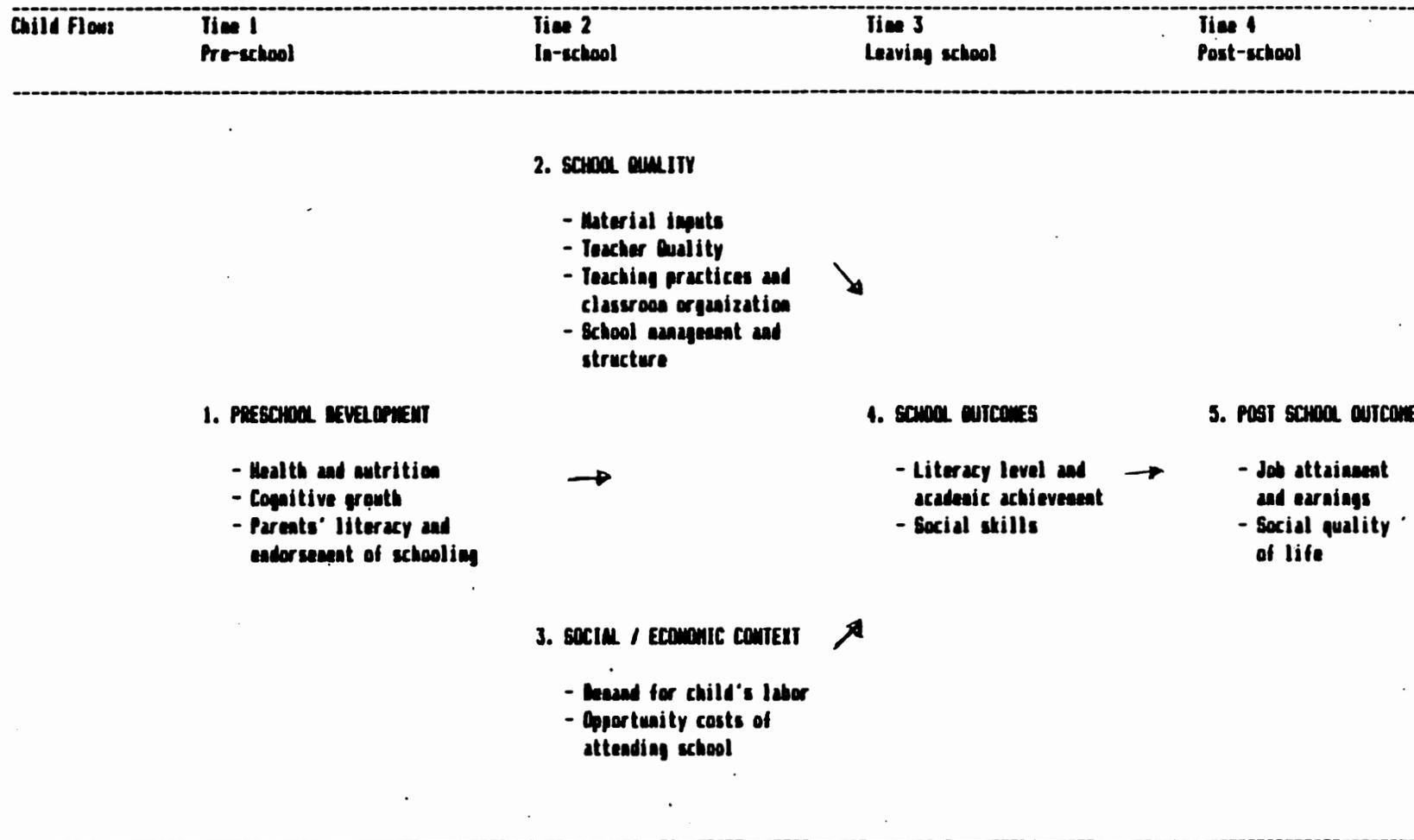
Second, this chapter summarizes research related to the influence of school quality on achievement. Debate continues over the relative strength of the school versus contextual factors in determining literacy and academic achievement. As outlined earlier, school quality now does appear to significantly influence achievement relative to the effects of the child's family background and the community context (in contrast to the latter two factors' overwhelming influence within industrialized countries). A decade of research has provided considerable evidence on the aggregate effect of school quality on student achievement. However, research from industrialized nations, and continuing skepticism over the school's impact, continues to influence development policy. Prior to delineating which school characteristics shape achievement, a review is provided of the school's aggregate force in boosting achievement.

A Value-Added Definition of School Quality

One useful way to grasp the distinct meaning of school quality is to back-up and ask, What factors inside and outside the school influence student achievement? We know that levels of literacy and school achievement are low within many Third World countries. But this low performance should not be entirely attributed to the school. Table 5 illustrates three forces which determine achievement levels. This simple model identifies school-related and contextual factors which operate as the child develops from birth.

At Time 1, prior to entering school, social contexts faced by young children vary enormously within developing countries. During this preschool period (Box 1) material conditions shape the child's health and nutritional status, which in turn shapes cognitive capacities. Parental and community beliefs regarding literacy and education, exercised early in the child's life, also have been found to influence later school

Table 5
Factors Influencing Student Achievement



achievement. Parenting practices also vary in terms of parents' nurturance of cognitive skills through various behaviors and interactions. Certain forms of interaction between parent and child are related to higher intellectual development and school achievement later in the child's life. This has been observed particularly among parents who more frequently ask their child questions, allow the child to solve problems with some degree of independence, and encourage early reading [2.1].

In Time 2, once the child enters school, characteristics of the institution may influence his or her level of literacy and academic skills. This potential degree of influence exercised by the school stems from the quality of school attended. Here the emphasis is on the quality of the instructional process experienced by each student -- the school's efficacy in imparting higher levels of literacy and cognitive skills.

Table 5 also illustrates factors external to the school which influence the child's eventual level of academic achievement (Box 3). Within many developing countries the strongest intervening factor is demand for the child's labor and his or her potential earnings, particularly within rural and poor urban families. On the other hand, more affluent families do not require that children contribute to the household's income. This frees considerable time for school attendance. Opportunity costs of entering and persisting through school also vary. This factor operates somewhat independently of the family's wealth. For instance, evidence from Mexico and Brazil suggests that children of more productive rural families attend school less, given higher opportunity costs [2.2]. Finally, immediate material and health conditions, including drought and disease, represent contextual factors which influence eventual school achievement.

School quality is defined here as (a) the level of material inputs allocated to schools per pupil (resource concentration), and (b) the level of efficiency with which a fixed amount of material inputs are organized and managed to raise pupil achievement.

This definition reduces the imprecision evident in looser uses of the term "school quality." First, the concentration of material resources per student disguises quality from the capacity or size of a school system. This is the fundamental conceptual shift for policymakers and local educators: Moving attention from how many children are being served, to what is the quality of instruction for each child?

Second, the definition emphasizes the school's value-added contribution to the child's achievement, independent of preschool background, community context, and ongoing demand for his or her labor. School quality cannot be validly measured in terms of the quality of outputs, unless factors outside the school organization are taken into account. A low quality school may graduate relatively high-achieving students -- if it serves children from more affluent families. Similarly, a school that effectively raises the literacy of, for instance, poor rural children would be of high quality -- even when graduates are achieving below urban children. The focus here is on the difference made by the school organization itself in boosting on children's literacy and academic skills.

Third, all characteristics and inputs of schools are not related to

achievement levels. The definition specifies that only inputs and management practices empirically linked to pupil performance are valid indicators of school quality. Other elements of schools (for instance, classroom laboratories) may come to be symbols of a "higher quality school." But labs would not be useful measures of quality, according to the definition, since they are not related to higher pupil performance. Similarly, marginal decreases in average class size yield no consistent gain in pupil performance (Chapter 3). But schools with somewhat smaller classes may be perceived as being of higher quality. Investing in a wide array of school quality may yield important symbolic benefits for both governments and development agencies. But unless the elements of school quality are related to achievement, the investment will be ineffective and lower the efficiency of schools in providing higher pupil performance.

Fourth, the definition emphasizes that a school's level of quality does not equal the aggregated sum of various material inputs (per pupil). In short, more is not necessarily better. Problems arise when one tries to measure total school quality in this way. The level of material inputs per pupil undoubtedly influence student achievement levels. This includes the availability of textbooks, desks, and writing materialst for each pupil. The length of the instructional program (per day and over the school year) also are determined by the level of material resources. And empirically, a school's global level of expenditures per pupil is a consistent predictor of student achievement, controlling for students' background.

However, looking only the level of material inputs ignores the question of whether these resources are efficiently managed. The definition proposed here emphasizes that the social organization or management of the school and the classroom also denotes the level of school quality. Research has identified three subsets of factors:

(a) Teacher quality, especially in terms of their own schooling, social class background, verbal proficiency, and motivation;

(b) Teacher behaviors within their classrooms, including efficient use of instructional time, the level of performance standards and expectations set for students, the extent to which teachers evaluate students' performance, and teachers' ability to place students in active learning roles, not simply requiring passive behavior by students; and

(c) Organization of the school, including the headmaster's management capability, a feeling of camaraderie among teachers, norms of achievement set by the headmaster, and the school's legitimacy within the surrounding community.

Simply increasing the level of material inputs does not guarantee that these management and social elements of quality will improve. Holding constant material resources per student, schools vary enormously in the quality of their management. Inadequate attention to these social variables may severely constrain the impact of additional material inputs.

Fifth, the definition distinguishes between the concepts of school quality versus internal efficiency. Schools which expend more resources per students are of higher quality in that they are more likely empirically

to graduate higher achieving students. Or developing countries that decide to shift scarce resources from expanding the number of schools to spending more per pupil, will improve school quality from the standpoint of concentrating funds on fewer children. In each case, schools will be better able to invest in those material inputs (e.g. textbooks) which will boost pupil achievement. These schools will become more internally effective. However, this does not necessarily mean that they will be more internally efficient. Among those school characteristics which are related to higher student achievement, a subset comprise the most efficient devices for raising student performance. For instance, textbooks may raise achievement less than would an equal investment in writing materials. Or the increment of achievement realized from textbooks may be at a cost three times the level required relative to an alternative school input. Thus the exercise of improving school quality or effectiveness is only a first step toward raising efficiency. The first requires investing in those inputs and organizational practices which relate to achievement. The second step necessitates identifying the most effective and least costly school characteristics on which investments can be focused [2.3].

I do not address one essential element of school quality — the content of curriculum — given its variation across cultural settings and schools. In contrast, material inputs and social organization are important elements of school quality, largely independent of the school's socialization or curriculum goals. However, latter two components of schools are neither culture-free nor neutral in their effects. For instance, schools and classrooms in China and Japan often are structured to encourage cooperation and interdependence among students. In contrast, schools in Western cultures generally emphasize individual competition and discourage interdependent forms of learning and working. The level of material inputs applied to schools variably serve to legitimate such social rules. And the social organization of schools may or may not fit ways in which a culture organizes families or workplaces. Yet the assumption made here is that under any type of formal socialization — within families, apprenticeships, within work settings, or in separate schools — improvements in educational quality require attention to material inputs and social organization. I focus on these two sets of school characteristics given their importance across diverse cultures and educational arrangements.

The Internal Effectiveness of Schools

The model of student achievement sketched in Table 5 prompts a fundamental policy question: What is the strength of school quality — relative to the child's preschool development and the community context — in shaping achievement levels? As introduced in Chapter 1, work within industrialized nations consistently finds that schools have little effect in determining academic performance or eventual economic success, after controlling for the student's preschool development and community background. These findings initially came from the Coleman Report in the U.S. and the Plowden Report in England over 15 years ago.

This early line of research continues to fuel skepticism over the wisdom of increasing school investments in developing countries. For instance, in 1975 a World Bank paper (Alexander & Simmons) addressed the

issue of whether schools influence academic achievement, reviewing research from Western Europe, the U.S., and initial studies from the Third World. Based on the research at that time, the authors concluded that schools made little difference in raising literacy and academic skills after accounting for the family background of children and their community context. However, the subsequent decade of research within the Third World yielded considerable evidence that school quality makes a substantial difference. And the impact of school quality relative to external factors appears to be greatest among the poorest developing countries.

The social class background of children -- operating through preschool experiences and ongoing community pressures -- at times does influence academic achievement in the Third World. One study in 37 Sri Lankan secondary schools found a high correlation between pupils' social class background and school performance. Evidence from India, Peru, and Malaysia suggests that this correspondence is stronger for achievement in reading than for student performance in math or science. One review of 33 studies of school achievement determinants focused, in part, on the frequency with which effects from students' background were discovered. The authors reported significant social class effects in 73 percent of the cases in which the influence of family background was empirically investigated. This evidence clearly suggests that preschool development and the community context makes a significant difference. But this work does not speak to the magnitude of social class effects relative to the influence of the school institution itself.*

This issue is directly addressed in one recent analysis of the contribution of school quality to student achievement within 16 developing and 13 industrialized nations (Heyneman & Loxley). An index of school quality was constructed for each country, based on those material characteristics of schools that were significantly related to pupil achievement (in science). Many material elements of school quality were included in the analysis, such as expenditures per pupil, textbook availability, length of the instructional program, and teacher credentials. The share of variation in student achievement explained by this school quality index relative to the variance explained by students' background was reported for each nation. Methodological difficulties arise in trying to distinguish between the relative strength of school quality versus student background when these two factors are highly correlated. That is, when the highest quality schools are located in the most affluent communities, it is difficult to disentangle the independent force of each factor. Covariation was found within some countries, including Finland, Japan, and Chile. Yet no correspondence between school quality and students' background was observed in other nations, including India, Thailand, and Italy [2.5].

Table 6 reports the extent to which school quality and students' family background contributes to student achievement in science. Their relative strength is expressed in terms of the share of variance in pupil achievement each factor explains. That is, achievement scores vary widely among youth within each country. The policy related question is whether a student's family background or the quality of school attended more strongly accounts for this variation in achievement. The percent of variance accounted for by each is reported for the poorest seven countries and for the seven most affluent nations included in the study.

In general, the aggregate index of school quality is a stronger determinant of achievement within the developing country group. Among all 29 nations included in the study, a strong negative correlation was apparent between the amount of variance in achievement explained by school quality and the nation's wealth. This offers initial evidence that school quality substantially shapes achievement, after controlling for the effects of the student's background. The strength of this pattern across diverse countries minimizes concern over some distortions which may result from the occasional correspondence between school quality and student background within a particular nation.

Table 6
Relative Influence of School Quality and Student Background

Country	GNP Per Capita US\$ 1971	Variance in Achievement Explained by:	
		Student Background	School Quality
India	\$110	3%	27%
Uganda	130	6	5
Botswana	160	6	14
Bolivia	190	11	24
Thailand	210	6	25
Egypt	220	6	14
Paraguay	280	23	16
Netherlands	2,620	22	11
Australia	2,870	17	7
French Belgium	2,960	14	16
Flemish Belgium	2,960	12	16
Germany	3,210	17	14
Sweden	4,240	18	7
United States	5,160	21	13

Source: Heyneman & Loxley (1983)

Summary

The allocative efficiency of educational investment stems from the clarity of how a problem is defined. General output definitions of "school quality" have resulted in rather vague ameliorative investments. A clear definition of quality should focus on the concentration of material resources per student and the efficiency with which these inputs are managed and structured within schools and classrooms. Quality should not be denoted by school characteristics which are unrelated empirically to higher student achievement. Nor should we ignore the influence of factors external to the school on student performance. The child's preschool development, for instance, plays a large role in later achievement in school.

On the other hand, the school's potential influence in raising literacy and academic skills appears to be considerable. This is true especially within the lowest income countries. Whether the child actually benefits from this potential effect depends largely on the quality of their school. Efforts to raise school quality are efficient given the institution's potential impact. These efforts, however, should move from careful definitions of the problem.

Chapter 3

What School Characteristics Boost Achievement?

Introduction

The influence of aggregate levels of school quality on student achievement is now firmly established for most Third World settings. However, much less is known about which elements of school quality are effective in shaping achievement. The first generation of research on school quality was concerned with determining whether the school organization made a difference. Therefore, the aggregate influence of various elements of school quality was investigated. Delineating which specific school factors boost pupil performance is a different task. In addition, shifting investments from school expansion to improving school quality and effectiveness is conceptually simple. But fine tuning investment policy to target resources on the most efficacious ingredients of schools is a more complex endeavor.

First, those elements of school quality which are effective in raising student achievement must be separated from those that are unrelated to pupil performance. Second, the magnitude of influence exerted by efficacious elements of school quality must be estimated. Third, the relative cost-effectiveness of significant school factors must be examined, accounting for differing magnitudes of influence and varying costs among different school quality elements. Whether policymakers and local school managers feasibly can move through each analytic step in detail is not clear. However, this simple stream of questions can certainly be pursued in many decision-making settings.

This chapter focuses on the first step: Identifying those elements of school quality which consistently boost pupil achievement and isolating the other set of school characteristics which make no difference. Research on this question has blossomed in the Third World over the past 15 years. Here the findings of 72 studies are reviewed. Little knowledge exists on the relative magnitude of effects from different school factors. And even less evidence is available on the relative costs of alternative school factors. More efficient use of resources would occur if school resources were shifted from ineffective to effective elements of quality. But even greater efficiency would result from centering investments on the most cost-effective ingredients of schools. Chapter 4 reports on what little research has been conducted in this area.

Lessons from Industrialized Countries?

School quality research in developing countries remains largely

reactive to the policy question initially asked two decades ago: Do schools make a difference in shaping the academic achievement and occupational success of young people? Only recently has research shifted from looking at whether school quality makes a difference to identifying which elements of quality consistently influence student achievement.

Yet research methods employed in the school quality field (within the Third World) continue to fit the more global question. That is, the focus is on the aggregate influence of school quality on achievement, after empirically controlling on the child's family background and community context. Typically these investigations study the general correspondence between student achievement levels and various school factors (for instance, class size, expenditures per pupil, and teacher qualifications) based on large scale school surveys. It is not unusual for such production-function studies to look at the independent influence of 15-30 elements of school quality on student achievement. The review of this empirical work which follows does report on specific school factors which do or do not consistently shape achievement. But this is really a secondary purpose of this line of research. Only the most recent work carefully assesses the relative impact of specific elements of school quality.

The school quality field is bounded by a second lasting effect of early research on school effects. The production-function metaphor continues to be relied upon to represent the schooling process. That is, the school organization is seen as a firm which receives material inputs and transforms these resources into the production of educated children. Following my review of Third World research, I examine the utility of applying a material production model to the largely social process of teaching and learning.

Overview / What Elements of School Quality Influence Achievement?

This summary of research is based on a review of empirical studies which examine the influence of school quality on pupil performance in developing countries. The studies vary widely on what particular school quality elements are examined. All investigations, however, control on the student's social class and economic background in some manner. That is, this literature examines the effects of school characteristics independent of family background and community influences. Each study also employed some means of testing for the statistical significance of any observed effect. Only statistically significant effects of school quality elements are reported in this review ($p < .05$ for beta coefficients, production-function elasticities, or f -values within experimental analysis of variance designs) [This review build on previous research summaries, 3.1].

Table 7 summarizes the findings from all studies reviewed. Column 1 indicates the specific elements of school quality which have been investigated. Column 2 reports the expected direction of correlation between the specific quality factor and pupil performance. Column 3 reports the number of statistical observations made between the particular school factor and achievement. For instance, among all studies reviewed, 11 analyses were conducted on whether expenditures per pupil was related to achievement. Each study examined a subset of school quality elements. On

Table 7
Influence of School Quality Elements on Student Achievement

(1) School Quality Indicator	(2) Expected Direction of Relationship	(3) Total Number of Analyses	(4) Number of Analyses Confirming Effect	(5) Number of Analyses Reporting No or Negative Effect	(6) Confirmatic Rate
School Expenditures					
1. Expenditures per pupil	+	11	6	5	54%
2. Total school expenditures	+	5	2	3	40%
Specific Material Inputs					
3. Class size	-	21	5	16	24%
4. School size	+	9	4	5	44%
5. Instructional materials					
Texts and reading materials	+	22	14	8	64%
Desks	+	3	3	0	100%
6. Instructional media (radio)	+	3	3	0	100%
7. School building quality	+	2	2	0	100%
8. Library size and activity	+	18	15	3	83%
9. Science laboratories	+	11	4	7	36%
10. Nutrition and feeding programs	+	5	5	0	100%
Teacher Quality					
11. Teacher's length of schooling					
Total years of teacher's schooling	+	25	11	14	44%
Years of tertiary & teacher training	+	30	21	9	70%
12. Inservice teacher training	+	5	4	1	80%
13. Teacher's length of experience	+	23	10	13	43%
14. Teacher's verbal proficiency	+	2	2	0	100%
15. Teacher's salary level	+	13	4	9	31%
16. Teacher's social class background	+	10	7	3	70%
17. School's percent of full-time teachers	+	2	1	1	50%
18. Teacher's punctuality & (low) absenteeism	+	2	0	2	0%
Teaching Practices / Classroom Organization					
19. Length of instructional program	+	13	11	2	85%
20. Homework frequency	+	7	5	0	71%
21. Active learning by students	+	2	0	2	0%
22. Teacher's expectations pupil performance	+	3	3	0	100%
23. Teacher's time spent on class preparation	+	5	4	1	80%
School Management					
24. Quality of principal	+	7	4	3	57%
25. Multiple shifts of classes each day	-	3	1	2	33%
26. Student boarding	+	4	3	1	75%
27. Student repetition of grade	+	5	1	4	20%

the other hand, an individual study may include analyses with the same quality factor for different pupil subgroups. Continuing with the example, Column 4 then reports that in seven of the 11 analyses a (statistically) significant relationship was found (again, always controlling the effects of the student's background).

Table 7 is useful in illustrating what elements of school quality have been most often studied. Both material inputs and teacher quality (proxies) have received the most attention from researchers. Despite growing research interest in the influence of teaching practices and school management within industrialized countries, these areas have received very little attention in the Third World literature.

In addition, Table 7 differentiates those elements of quality which are not consistently related to student achievement from those factors which more frequently appear to exert an influence on performance. Elements of school quality which are significantly related to achievement in at least one-half of the analyses are assumed to hold a "consistent" influence. This definition is somewhat arbitrary. Yet this rule of thumb is based on the fact that most of the studies reviewed included more than 10 elements of quality in multivariate models. Therefore, even when an element is related to achievement it will not appear to be statistically related if it covaries with another indicator of school quality.

Given this body of evidence, school factors which influence pupil achievement can be distinguished from those which do not.

Set 1 Quality elements not consistently related to achievement:

- | | |
|-------------------------------------|----------------------------------|
| 1. Class size | (no effect in 16 of 21 analyses) |
| 2. Laboratories | (no effect in 7 of 11 analyses) |
| 3. Individual teacher salary levels | (no effect in 9 of 13 analyses) |

Set 2 Quality elements consistently related to achievement:

- | | |
|--------------------------------------|-------------------------------|
| 4. Expenditures per pupil | (effect in 6 of 11 analyses) |
| 5. Instructional materials | (effect in 17 of 25 analyses) |
| 6. School library activity | (effect in 15 of 18 analyses) |
| 7. Teacher training (tertiary level) | (effect in 21 of 30 analyses) |
| 8. Length of instructional program | (effect in 11 of 13 analyses) |
| 9. Teacher's social class | (effect in 7 of 10 analyses) |

Patterns of influence are mixed for several other elements of school quality. For instance, the teacher's total length of schooling (including years in primary and secondary school) affected achievement in 10 of 24 studies. Whether this is a "consistent pattern" is difficult to infer. Other quality factors show promise, particularly frequency of homework, use of instructional radio, and inservice teacher training. But an insufficient number of studies have been completed from which to generalize.

Interpretation of these general patterns must be couched within the features of specific studies. The following discussion details research within each area of school quality. The review will also highlight findings on the magnitude of reported achievement effects from specific elements of school quality. However, this area is problematic. Any one factor's level of influence on achievement depends upon many aspects of the research design. Empirical models and data sets vary enormously in (a) the number of factors included in each multivariate model, (b) the level of observed variance for specific elements of quality, (c) the amount of measurement error for indicators of quality, (d) the degree of colinearity among quality variables, (e) the level of instruction studied, and (f) the diversity of settings within which schools are studied. It is difficult for researchers to employ even roughly consistent designs and impossible to hold constant scope conditions within which findings would apply. And again, central concern with the aggregate question — does school quality makes a difference — diverts attention from the critical issue of what is the magnitude of observed effects among different school factors.

I turn next to reviewing findings within each of the primary areas of school quality. A table summarizing the literature accompanies each discussion below. Citations have been kept to a minimum in the text, since the tables contain formal reference information.

Overall School Expenditures

Table 8 summarizes existing empirical studies that have examined the influence of **expenditures per pupil** and total school expenditures on student performance. Each expenditure measure is a global indicator of quality. Per pupil expenditures more directly indicate the concentration of school resources on each student enrolled in school (Indicator 1). The bulk of resources go to teacher and school staff salaries. Therefore, this global measure does not indicate teacher quality nor specify the level of resources allocated to books, instructional materials, or other inputs more directly linked to the instructional process. Different analyses look at various areas of achievement (Column 4). Any reported effect (Column 5) is statistically significant ($p < .05$). Some findings are limited to certain conditions (specified in Column 6). And the studies reviewed utilize various methods (see Column 7 and notes at the foot of Table 8).

Summarized above, a majority of studies have found a positive relationship between school expenditures per pupil and achievement. The influence of this school quality element is strong in some analyses. For example, in the Colombian study of academic achievement (4,233 secondary school graduates), the influence of per pupil expenditures was exceeded only by the youth's verbal ability (comparing t-statistics among 24 student background and school factors tested). The influence of this factor was only slightly less strong for achievement within the commercial curriculum. This same study found more moderate, but significant, achievement effects in Tanzania (2,803 secondary graduates).

The magnitude of the achievement effect from per pupil expenditures was thoroughly examined within an early study of primary and secondary school students in Kenya. No significant effect was found at the primary school level. At the secondary level, per pupil expenditures did influence

Table 6
Efficacy of School Quality Elements:
School Expenditures*

(1) School Quality Indicator	(2) Hypothesis	(3) Country (School Level)	(4) Achievement or Economic Outcome Measured	(5) Direction of Effect			(6) Setting	(7) Study (Method)
				+	0	-		
1. School expenditures per pupil	Higher expenditures will provide higher quality teachers and learning resources, leading to higher achievement	Argentina (Primary)	Science achievement	+				Heyneman & Loxley (M)
		Kenya (Primary)	National exam		0			Thias & Carnoy (PF)
		(Secondary)		+				
		Malaysia (Secondary)	Comprehensive exam		0			Beebout (MR)
		Mexico (Primary)	Agricultural & manufacturing output	+				Fuller et al. (PF)
			Science		0			
		Colombia (Secondary)	Academic & vocational	+				Heyneman & Loxley Psacharopoulos & Loxley (MR)
		Tanzania	Vocational knowledge Language	+		0	For 2 of 3 tracks	
		Bolivia (Primary)	Science	+		0	Urban schools Rural schools	Morales & Pinellisile: (MR)
		2. Total school expenditures	Overall expenditures reflect higher quality, leading to higher student achievement	Chile	Science	+		
Brazil					0			
Paraguay						0		
Colombia						0		
Mexico					+			

* Column headings: Column 3 indicates both the country within which the research was conducted and the school level of students studied (primary or secondary grades). The school level last specified applies to the current country, reading down the column, unless a new school level is indicated.

Column 5 reports a positive or negative effect only when the study found a statistically significant influence of the particular school quality input ($p < .05$). When a "0" is indicated in Column 5, this means that no significant effect was found for this school quality input. The direction of the effect reported relates to the direction indicated in the stated hypothesis (Column 2).

Column 6 specifies a specific condition under which the findings hold. If no scope condition is specified, the effect was found for the entire sample of students being investigated.

Column 7 mentions the type of empirical analysis utilized by the researcher(s). The following symbols were used: MR = multiple regressions with reporting of beta coefficients; PF = a log-linear production function with a report of elasticities; CG = an experimental or comparison (control) group study was conducted; CO = correlation coefficients were reported; bivariante correlations reported only when no relationship was found.

achievement. The researchers then estimated the magnitude of this effect. Second, they identified the strength of relationship between higher national test scores (indicator of achievement) and future earnings. The authors found that raising national exam scores among sampled secondary students by five percent would require a 50 percent boost in expenditures per pupil. Yet the rate of return to this investment in terms of increased income would be significant (six percent) -- but only among low achieving students. For relatively high achieving students, income benefits gained from higher test achievement were entirely offset by the cost of raising achievement.

A growing amount of research within industrialized countries suggests that per pupil expenditures -- as a concrete indicator of school quality -- is related to individual income of graduates. This claim has not been extensively tested in developing countries.

Four analyses have found no achievement effects from higher per pupil expenditures, including well designed studies in Malaysia and Tanzania. In addition, one might argue that schools must reach a threshold size before achievement can be significantly influenced (Indicator 2). Yet in terms of total expenditures, just one in four analyses discovered a statistically significant effect.

Specific Material Inputs

The second set of school quality elements includes discrete material inputs which operate more closely to the instructional processes (Table 9). First, Third World findings on possible achievement effects from smaller class size are quite similar to research within industrialized nations (Indicator 1). Within normal ranges, the presence of fewer students per classroom has no consistent affect on achievement. No effect from smaller class size has been found in 11 of 21 analyses. In five additional studies, students working within larger classes actually performed at higher levels. We should be quick to point out that "normal ranges" are often exceeded in the poorest developing countries, given that the mean national ratio of pupils to each teacher equals 44 within the poorest nations as reported in Chapter 1. Note that due to double shifts, this is not an exact measure of class size. Further, achievement effects for specific ranges of class size have not been investigated in the Third World.

Yet given this existing evidence, only substantial reductions in class size would likely raise achievement. And modest increases in class size would free up a significant level resources while not diminishing overall student achievement. Just one study has found that smaller classes at the primary level are significantly related to higher achievement. This report comes from an analysis of science achievement among 837 urban students in Colombia. The bulk of studies simply reports no effect for class size.

Two studies have examined the magnitude of the class size effect (or lack thereof). First, the Malaysia study of 89 secondary schools found a significant effect of smaller class size and pupil achievement in language learning (in Malay). The researcher then estimated the marginal (achievement) product associated with spending one additional dollar to

Table 9
Efficacy of School Quality Elements:
Specific Material Inputs

(1) School Quality Indicator	(2) Hypothesis	(3) Country (School Level)	(4) Achievement or Economic Outcome Measured	(5) Direction of Effect			(6) Setting	(7) Study (Method)	
				+	0	-			
1. Class size	Fewer students per teacher will improve the quality of interaction and raise achievement	Botswana (Primary)	Science			-		Meynean & Loxley Loxley (MR)	
		Thailand	Reading & science			-			
		India			0				
		Chile (Secondary)			0				Comber & Keeves (MR) Schieffelbein & Farrell (197)
					0		-	Poorer schools	
		Iran	Reading & math	+					Thorndike (MR) Ryan (MR)
		Egypt (Primary)	Literacy & numeracy			0			Hartley & Swanson (MR)
		Kenya	National exam			0			Thias & Carnoy (MR)
		Malaysia (Secondary)	Comprehensive exam	+					Beebout (MR)
		(Primary)				0			Haron (MR)
		Puerto Rico (Primary/sec.)	Reading	+					Carnoy (MR)
		Tanzania	Language	+					Psacharopoulos & Loxley
			Vocational knowledge			0			
		Indonesia (Secondary)	Letters & arts exam			0			Seabiring & Livingstone (MR)
		Bolivia (Primary)	Science					-	Urban schools
		Argentina	Reading			0			Urban schools
		Colombia	Science			0			Echart et al. (MR)
				+			Urban schools	Arriagada (1981, MR)	

2. School size	When a threshold school size is reached, higher quality resources will be available, raising achievement	Chile (Primary)	Reading & science	+		Cooper & Keesee	
		Thailand		+			
		Iran		+			
		Kenya (Primary)	Cambridge exam		-		Thias & Carnoy
		Kenya (Secondary)		+			
		Malaysia (Primary)	Comprehensive exam		-		Beebout
		Congo	Language & math		0		Haron
		Bolivia (Secondary)	Reading & science		0		Youdi (MR)
							Morales & Pinellisiles
3. Instructional materials	Greater availability of texts and reading materials will raise the quality of learning activities, increasing achievement	Uganda (Primary)	Comprehensive exam	+	(Actual counts)	Heynenan & Janison (MR)	
		Uganda (Secondary)		+		Heynenan (MR)	
		Egypt	Science	+	(Student/teacher reports of adequacy)	Heynenan & Loxley	
		El Salvador		+			
		Paraguay		+			
		Bolivia		+			
		Mexico		+			
		Peru			0		
		Brazil			0		
			Comprehensive exam	+		Student owns text	Wolff (MR)
		Colombia	Reading & math		0		
		Argentina			0		
		India	Reading & science	+		Science texts	Cooper & Keesee
		Chile	Language & math	+			Schiefelbein & Farrell (1973)
		Nicaragua	Math	+			Janison et al. (CG)
		Philippines	Science	+			Heynenan et al. (CG)
		Indonesia (Secondary)	Arts & science		0		Seabring & Livingstone
		Thailand (Primary)	Comprehensive exam		0		Fuller & Chantavanish
		Malaysia		+		Rural schools	Haron
					0	Urban schools	
Ghana (Secondary)	Reading comprehension	+			Smart (CG)		
Malaysia	Language skills		0		Beebout		

	Provision of desks will increase opportunity to read and write, raising achievement	Egypt (Primary) El Salvador Peru	Science Reading	+ +		Heyneman & Loxley Arriagada (1983; MV)
4. Instructional media	Radio and other instructional media efficiently raises student achievement	Nicaragua (Primary) Philippines	Math Student promotion Language, math & science	+ + +		Janison et al. (MR) Janison (MR) Heyneman et al.
5. Physical facilities	Better facilities provide more motivating conditions for learning	Uganda (Primary) Peru (Primary)	National exam Reading & science	+ +	Composite of facility quality Electric lights	Heyneman & Janison Arriagada (1983)
6. Library activity	The presence and active use of a school library will boost reading achievement	Argentina (Primary) Brazil Mexico Bolivia Paraguay El Salvador Botswana Peru Chile (Primary/sec.) Iran Thailand India Malaysia (Secondary) (Primary) Indonesia (Secondary) Botswana (Secondary)	Science Comprehensive exam Arts & science Reading & math	+ + + + + + + + + + + + + + + + + + +	0 0 0	Heyneman & Loxley Costa (MR) Heyneman & Loxley Arriagada (1983) Thorndike Beebout Volumes in libraries In-class libraries Haron Seabring & Livingstone Loxley

7. Laboratories	The presence and instructional time spent in laboratories will raise science achievement	India	Science	+		Heynenan & Loxley	
		(Primary)					
		Thailand		+			
		Iran		+			
		Brazil		+			
		Chile			0		
		Peru			0		
		Paraguay			0		
		Mexico			0		
		Colombia			0		
Argentina			0				
Bolivia			0				
8. School feeding programs	Malnutrition will lower student achievement	Guatemala	Verbal skill & enrollment	+		Balderston et al. (NR)	
		(Primary & sec.)					
		Egypt	Reading & math	+		Occurrence of illness	Hartley & Swanson
		(Primary)					
		Chile		+			Schiefelbein & Farrell (1970)
Thailand			+		Fuller & Chantavanich		
Uganda	Comprehensive exam		+		Heynenan & Janison		

help lower class size. Raising student achievement by just one percent (on standardized exams) would cost an additional \$50 per student if allocated to help lower class size. In contrast, this same increment in higher student achievement could be accomplished at one-third the cost if resources were allocated to teacher training. Cost data used for these estimates are admittedly rough. But this method for comparing the cost-effectiveness of alternative elements of school quality is instructive.

A second study examined the relative magnitude of achievement effects resulting from the introduction of textbooks, from establishment of radio instruction (in Nicaragua), and from lowering class size (in the U.S.). Various experimental studies provided an estimate of how strongly each factor influenced achievement (in terms of standard deviation gains between control and treatment groups). The researcher then estimated the cost of achieving the same gain in achievement from each element of school quality. To obtain the achievement benefit gained from raising the availability of textbooks at a constant increment of cost, schools must lower average class size from 40 to 10 pupils per teacher! This method of equating the costs for alternative inputs against a standard gain in achievement yields a clear picture of the relative efficiency of alternative interventions. The efficiency of introducing radio instruction was even higher than boosting the availability of books in the Nicaraguan case. The main point remains: In most situations lowering class size with the intent of raising achievement is not an efficient strategy [3.2].

The positive impact of instructional materials -- especially those directly related to reading and writing -- is consistent across several studies. The availability and use of textbooks (measured, for instance, in terms of the number of textbooks in a classroom per student) have been looked at in 22 analyses (Indicator 3). Significant effects were observed in 14. Early research in the 1970's relied on IEA survey instruments which asked students and teachers about simple availability of textbooks in classrooms [3.3]. This factor also was significant in many Latin American countries which employed these measures. Actual counts of textbooks in Uganda also revealed a significant influence on pupil achievement.

This survey research generally indicates a moderate influence of textbooks and instructional materials on achievement. In Uganda, for instance, textbook availability strongly influenced achievement in English, dwarfing the effects of the child's social class (based on 1,907 students in 61 primary schools). However, averaging across curriculum areas to look at total achievement levels, the influence of textbooks was smaller than social class, preschool competence, pupil health, and the teacher's verbal (English) proficiency (comparing t-statistics). In Malaysia and Chile, textbook availability was related to higher achievement. But the correlation between these two variables was less than .20, prior to controlling for the effects of student background or other school quality elements. Textbooks did not explain more than four percent of the variation in achievement among all students sampled within each country.

The influence of textbooks appears to be stronger within rural schools and among students from lower income families. In rural Brazil, for instance, students with parents who had received no schooling were almost three times as likely to pass primary school if they had used two or more books (67 percent graduating), compared to students in this same group who

had no textbooks in school (only 24 percent graduating). Among students with parents who had completed primary school, 73 of all pupils with at least two books passed primary school, versus 61 percent of those with no books (total sample equalled 1,006 primary school students). Similarly, the study of 6,056 Malaysian youth found that the availability of books in school was more strongly related to achievement among lower income children from Chinese and Indian ethnic groups.

Clearer evidence on the magnitude of textbooks' effect comes from more recent studies which have employed experimental research designs -- thereby holding constant student background and other school factors. For instance, a controlled evaluation in the Philippines provided textbooks to 2,295 first and second grade pupils within 52 schools. A control group of similar schools was also selected. Books were then introduced at ratios of 2 pupils per book and 1 pupil per book in alternate classrooms. Achievement gains resulting from the intervention were substantial. In first grade science, performance was .51 of a standard deviation higher within the experimental classrooms, .30 higher in mathematics, and .32 higher in Pilipino. The .51 change (in units of the standard deviation) indicates that the mean score achieved by 50 percent of all students was obtained by 69 percent of those students in the treatment group. This improvement is twice the impact of what would be gained by lowering class size from 40 to 10 students (Philippines textbook data, U.S. class size data).

The influence of the textbook program on achievement was greater for children with parents who had received less schooling. The correlation between the child's social class and science achievement was modest for all students. Yet this association was not at all evident for pupils receiving textbooks. Nor did the child's social class influence gains in achievement scores. Interestingly from an efficiency viewpoint, the concentration of textbooks (2:1 versus 1:1 pupil to book ratio) made no difference on levels of pupil achievement. The magnitude of effect on Pilipino and mathematics was more modest. This may be the result of greater difficulty in using these latter texts relative to the science volume, as reported by the teachers.

Less robust, yet significant effects of textbooks were found in an experimental program in Nicaragua. Eighty-eight (88) first-grade classrooms within rural and urban schools participated in the program, including 1,098 children. These classrooms were split into three groups: those receiving textbooks, those receiving radio instruction, and those serving as control classrooms (the findings for radio instruction are reviewed below). The interventions were applied at the beginning of the school year. Post-tests were given at the end of the same academic year. Pupils who received textbooks scored four percent higher on the mathematics post-test (one-third of a standard deviation). The researchers note that Nicaraguan teachers were less schooled than teachers in the Philippines. The latter also had more experience with textbooks either as students themselves or during their teacher training.

A variety of measures have been used in survey studies to determine the presence and use of textbooks. The initial IEA research asked individual students to simply report whether a textbook was "available" to children to help in their studies (used in India, Iran, and Chile). Other

studies have asked students whether and how many textbooks are owned (in Chile and Brazil). This indicator is more relevant in Latin America where texts are often sold by private booksellers to parents and students. In the Uganda study, the researcher actually counted how many textbooks were available and used within each classroom setting. No work has been found on how often and within what context students read textbooks. We do not know whether texts are read in class, at home, alone, or with other students. The impact of textbooks may be understated if measurement error is high. Distilling out disturbance caused by factors related to how and with what frequency books are read may sharpen our understanding of how strongly texts influence achievement. Future research might examine this finer-grain question. In addition, some uniformity in measures used by researchers would aid future comparisons of findings across studies.

Desks in classrooms represent an additional input within the instructional material category. All three analyses examining the effect of this concrete element of school quality have found significant achievement effects. For instance, a recent study of 324 sixth-grade students in Peru, discovered that the percent of children with desks at school was more strongly related to reading achievement than was the influence of social class background (comparing t-statistics). Surprisingly little research has examined the effects of simple inputs related to opportunities to read and write inside the classroom (as well as outside the school).

As with textbooks, the availability of a desk is easily measured and observed achievement effects obviously are important. But we know little about how children's classroom time is structured, particularly how the material desk fits into opportunities to read and write. In some instances the desk may hold more utility as a symbol of constructing a "modern school." Whether teachers structure lessons to encourage the actual use of desks is a separate issue. Encouragement of students to write may be more important than reading from the standpoint of motivation. Writing is a productive form of literacy. Rather than passively reading material, writing involves active creation of ideas and organization of information. But we have little understanding of how instructional materials can better encourage writing activity.

The **radio** is another instructional device which has received considerable attention from researchers (Indicator 4). Initial production of curriculum and classroom lessons is difficult and costly. Yet following the initial investment, delivery of radio instruction via simple receivers can be efficient in terms of per pupil costs. The Nicaragua textbook program outlined above also included a radio instruction project. The radio component was more effective than the textbook element in raising achievement. Participating first-grade students received mathematics instruction over a radio for 20-30 minutes within their classrooms. Post-broadcast lessons were often given by the teacher, and worksheets were provided students to practice the material. At the end of the first grade, participating students scored 17 percent higher on the post-test compared to control-group pupils. This gain exceeded one standard deviation on the post-test [3.4].

A **school library** is another instructional resource which may significantly influence pupil achievement (Indicator 6). Significant

student performance effects have been found in 15 of 18 analyses. The most consistent findings come from Latin America where multiple measures of school library utilization were used. Building on the early instruments from the Coleman and IEA projects, a survey of school quality was conducted in seven Latin American countries in 1975. The number of books on loan from a school library was significantly related to student achievement levels within Argentina, Mexico, and Brazil. At the individual level of analysis, students reporting that they used the library more frequently performed at higher levels (as always, controlling for pupils' family background). Other research indicates that the simple presence of a school library is related to the school's average achievement level in El Salvador, Botswana, and Uganda.

These findings come from one major analysis of the influence of school quality on science achievement (by Heyneman & Loxley). Within this work, a minimum criterion of statistical significance was utilized ($p < .05$) to determine whether the school library measure was significant after controlling for family background factors. The efficacy of the library variables is confirmed by earlier findings from the IEA study within Thailand, Iran, Chile, and India. Yet neither project analyzed the magnitude of this consistent effect of from the presence of a school library and utilization rates. The study of Malaysian primary schools (6,056 students) did find significant effects of school library size (number of volumes) and academic achievement. However, the bivariate correlation between the two was small. And within multivariate analyses, the achievement effect of library size was significant yet much less strong than social class control variables and availability of textbooks. In Botswana, a study of 869 standard seven students found statistically significant achievement effects for how often the library was used (individual student report) and the number of new volumes purchased by the library (school report). The strength of this relationship was comparable to the significant influence of social class background, appearing for both reading and mathematics achievement.

The early IEA survey included questions which asked schools about the use of classroom laboratories in the teaching of science (Indicator 7). This particular material input remains controversial. Governments and development agencies have invested sizable resources in building school laboratories and in financing the purchase of laboratory equipment. Whether this investment is paying off in higher levels of achievement remains an unanswered question. The early IEA survey asked schools about the presence and utilization of classroom laboratories. These measures were rather consistently related to higher achievement in three of the four developing countries included in the study: India, Thailand, and Iran. Two indicators of laboratory use -- number of students in laboratory classes and time spent in laboratory work -- were related to achievement. However the subsequent Latin American survey used these same items and found no significant relationship with pupil performance [3.5]. No analyses were found which examine the effectiveness of laboratories relative to other elements of school quality. Nor do the earlier IEA findings mean that laboratories are cost-effective. The high cost of building, equipping, and maintaining school laboratories may outweigh subsequent incremental gains in achievement.

Finally, school feeding programs have received only slight attention

from researchers (Indicator 8). More is known about the effects of poor health, malnutrition, and hunger on children's school achievement than the ameliorative effects of school feeding efforts. The effects of poor health can be dramatic. In a recent study of 3,699 primary school students and dropouts in Egypt, health status was one of the strongest predictors of academic achievement. For instance, children who had suffered from a serious illness in the preceding year scored 20 percent lower on the literacy test and about 10 percent lower on the numeracy exam. Children who had a major physical disability or suffered from malnutrition also achieved at significantly lower levels.

An earlier study in 61 Ugandan primary schools provided similar results. Multiple measures were used, asking the children whether they had suffered from malnutrition, how often they had chills or a fever, how often they had stayed in a clinic overnight, and whether they had seen blood in their stools. Among the 1,907 surveyed, 75 percent reported having suffered from Malaria; 37 percent answered that they had stayed overnight in a clinic or hospital; 12 percent had seen blood in their stools; 5 percent claimed they had been treated for malnutrition. This latter 5 percent alone performed a quarter of a standard deviation below all other students on a standard achievement test. Controlling for family background and other school quality elements, pupil health (overall index) contributed significantly to academic achievement. Similar findings also are reported from studies in Chile, Thailand, and a longitudinal investigation in Guatemala. The Guatemala work included study of 512 children from four rural villages. Longitudinal achievement effects for diet were found after controlling for earlier levels of health and nutritional intake. Yet very little empirical evidence substantiates the effects of child health and nutrition interventions on eventual academic performance.

Teacher Quality

At this point only material inputs to the schooling process have been discussed. But how are material resources managed by the teacher in structuring learning activities? One way to approach this question is to look at the quality of teachers. Since most school quality research in the Third World has relied on large scale surveys, easily measured proxies of teacher quality have been used most often. For instance, many studies have asked about teachers' qualifications in terms of their total length of schooling or their amount of postsecondary teacher training. Whether and how these proxies are related to the teacher's proficiency in organizing instructional activities and in motivating children remains very cloudy.

Yet even rough measures of teacher quality are related to higher levels of student achievement (Table 10). Findings are mixed on the effect of the length of primary and secondary schooling completed by teachers (Indicator 1). This factor has been studied in 25 analyses across many countries. A significant relationship was found in 11 of these studies. The strength of this relationship is moderate in a few of these analyses. The IEA survey of literature achievement in Chile included 103 schools and 1,311 students. A moderate correlation between teachers' school attainment and pupil performance was observed ($r=.34$); the significance of this factor remained when the factor was analyzed after controlling for student background and other school quality elements. An early study of school

Table 10
Efficacy of School Quality Elements:
Teacher Quality

(1) School Quality Indicator	(2) Hypothesis	(3) Country (School Level)	(4) Achievement or Economic Outcome Measured	(5) Direction of Effect			(6) Setting	(7) Study (Method)	
				+	0	-			
1. Pre-service teacher training	The teacher's years of primary and secondary schooling will raise their verbal skills, boosting student achievement	India (Primary)	Science	+				Heyneman & Loxley	
		Uganda		+					
		Bolivia		+					
		Brazil (Secondary)		+		0		Morales & Pinellisiles	
		Chile		+				Husen (MR)	
		Paraguay (Primary)				0		Heyneman & Loxley	
		Mexico				0			
		Peru				0			
		Colombia				0			
		Argentina				0			
		Thailand	Language & math		0			Fuller & Chantavanich (MR)	
		Botswana	Reading		0			Husen (CO)	
			Reading & math		+			Loxley	
		Mexico 42 LDC's	Language & math		0			Izquierdo & Guzman (CO)	
			Drop-out rates		0			Levy (MR)	
								[Cross-national design]	
			The teacher's years of post-secondary instruction and teacher training will boost teaching skills, leading to higher student achievement	Botswana (Primary)	Science	+			Heyneman & Loxley
				India	Reading & science	+		Reading teachers	Cooper & Keeses
		Chile		+		Reading teachers			
		Thailand		+		Science teachers			
		Iran		+		Science teachers			
		Egypt	Reading & math	+					
			Literacy	+			Hartley & Swanson		
			Numeracy		0				
		Mexico (Primary)	Science	+			Heyneman & Loxley		
		(Secondary)		+			Klees (MR)		

	Argentina (Primary)	Reading & math	+	0		Heyneman & Loxley Echart et al. (NR)
	(Secondary)		+			
	Peru (Primary)	Science	+			Heyneman & Loxley
	Bolivia		+			
	Paraguay (Primary)	Reading & math	+			
	(Secondary)			0		Rivarola & Corvalan (NR)
	Brazil	Science	+			Costa (NR)
	Colombia			0		Heyneman & Loxley
	Thailand	Language & math	+			Arriagada (1981; MV)
	Malaysia	Reading	+			Fuller & Chantavanich
		Comprehensive exam	+		Rural schools	Ellson (CG)
				0	Urban schools	Haron
	Uganda	National exam		0		Heyneman (1976; NR)
				0		Somerset (CO)
				0		Silvey (CO)
	Sierra Leone			0		Mindhan (CO)
	Ghana (Secondary)		+			Bibby & Peil (NR)
	Indonesia	Arts & letters	+			Seabiring & Livingstone
		Science		0		
The teacher's total years of formal schooling will raise verbal skills and teaching effectiveness, raising student achievement	Puerto Rico (Primary)	Reading	+			Carnoy
	Iran	Language & math		0		Ryan
	Malaysia (Secondary)	Comprehensive exam	+			Beebout
	Congo	Language & math	+			Youdi
	Kenya	National exam		0		Thias & Carnoy
	Chile	Language & math		0		Schiefelbein & Farrell (1973)
	Tanzania	Academic & vocational		0	For 3 of 4 tracks	Psacharopoulos & Loxley
	Brazil (Primary/sec.)	Individual income	+			Behraan & Birdsall (PF)
	Uganda (Secondary)	Comprehensive exam		0		Silvey (NR)
	Sierra Leone (Primary)			0		Somerset (NR)
				0		Mindhan (CO)

	More highly schooled teachers will boost parents' demand for more schooling, and raise academic achievement	Brazil (Primary)	Students' mean years of school completed	+		Behrman & Birdsall
2. Inservice teacher training	Upgrading the skills of current teaching staff will raise the quality of instruction, leading to higher student achievement	Egypt (Primary)	Literacy & numeracy	+		Hartley & Swanson
		Indonesia	Arts & science Language	+		Seahring & Livingstone Masotion et al. (MR)
		Botswana	Reading & math	+	0	Loxley Husen
3. Teacher's length of experience	Teachers with longer tenure develop stronger instructional skills, raising student achievement	El Salvador (Primary)	Science	+		Heynean & Loxley
		Iran		+		
		India		+		Reading teachers Reading teachers
		Chile		+		
		Uganda (Primary)	National exam		0	Heynean (1976)
		Chile (Secondary)	Language & math		0	Schiefelbein & Farrell (1973)
		Egypt (Primary)	Literacy & numeracy		0	Hartley & Swanson
		Puerto Rico (Primary)	Reading	+		Carnoy
		Puerto Rico (Secondary)			0	
		Kenya	National exam	+		Thias & Carnoy
		Malaysia (Primary)	Comprehensive exam	+		Beehout Haron
		Tunisia (Secondary)	Grade point average		0	Carnoy & Thias
		Congo	Language & math		0	Youdi
		Colombia	Reading & science	+		Arriagada (1981)
		Mexico	Language & math		0	Klees
Indonesia	Arts & science		0	Seahring & Livingstone		
Bolivia (Primary)	Reading		0	Morales & Pinellsiles		
Paraguay			0	Rivarola & Corvalan		
Brazil		+		Costa		
Argentina (Primary & sec.)			0	Echart et al.		

		Botswana (Primary)	Reading & math	+	0	Years teaching Age	Loxley	
4. Teacher's verbal proficiency	Teachers with greater verbal skills increase the quality of student and teacher interactions, increasing achievement	Uganda (Primary)	National exam	+			Heyneman & Janison (NR)	
		Iran		+		Rural schools	Ryan	
5. Teacher's salary	Higher paid teachers possess higher language and instructional skills, raising student achievement	Peru (Primary)	Science	+			Heyneman & Loxley	
		Bolivia		+				
		Brazil				0		
		Paraguay				0		
		Mexico				0		
		Argentina				0		
		Kenya	National exam	+				Thias & Carnoy Heyneman & Loxley
		Colombia				0		Psacharopoulos & Loxley
6. Teacher's social class	Teachers with more highly educated parents will possess greater language proficiency and increase achievement	Colombia (Secondary)	Academic & vocational knowledge			-		
		Tanzania	Language			0		
		Bolivia	Vocational knowledge Reading & science	+			-	For 2 of 3 tracks Urban schools Rural schools Morales & Pinellsiles
7. Teacher's absenteeism and punctuality	Teachers displaying greater punctuality are more highly motivated and effective	Argentina (Primary)	Science	+			Heyneman & Loxley	
		Peru		+				
		Bolivia		+				
		Paraguay		+				
		Brazil		+				
		Mexico				0		
		Colombia				0		
		Chile	Verbal & math	+				Farrell & Schiefelbein
		Iran		+				Ryan
		Uganda	National exam				0	Heyneman (1976)
8. Full-time versus part-time teachers	Full-time teachers will possess more motivation and teaching effectiveness	Thailand (Primary)	Language & math			0	Fuller & Chantavanich	
		Mexico				0	Izquierdo & Guzman	
		Indonesia (Secondary)	Arts & letters Science	+		0	Seabiring & Livingstone	

quality in Puerto Rico found that teachers' schooling level was most strongly related to achievement of primary students and among pupils from lower-income families. No significant relationship was found for secondary school students [3.6].

Teacher schooling effects have been negligible in several other studies. For example, a study of over 27,000 Thai primary school students found a statistically significant, yet small association ($r=.11$). This low level of magnitude is troubling from a policy viewpoint. Allocating additional resources to increase teacher candidates' total length of schooling may be an inefficient strategy for raising pupil achievement. One analysis based on IEA data for Chile and India found that moving the average length of teachers' schooling to the 75th percentile (of the range of teacher schooling previously found in these countries) would boost pupils' reading scores by 10 percent. But the cost of such an improvement would be extraordinary [3.7].

In contrast, achievement effects are more consistent for teachers' length of tertiary schooling and number of teacher training courses. The early IEA survey included items on both of these areas; identical measures were used in the subsequent Latin America survey. As seen in Table 10, either the original IEA research group or the later analysis by Heyneman and Loxley found significant effects from at least one of these factors in 11 countries. Independent work in 10 other countries has revealed significant effects. In total, 21 of 30 studies have found a significant association between teachers' level of tertiary or teacher training and later achievement of their students.

The magnitude of this relationship at times is moderate. One study of 89 secondary schools in west Malaysia (7,674 pupils) found a notable correlation between length of teacher training and student achievement ($r=.27$). This factor retained its significance when entered into a multivariate model which controlled for the effects of pupils' family background and other elements of school quality. This research also discovered an achievement effect for the interaction of teacher training and length of teaching experience. Similarly, the IEA study found a modest bivariate correlation for science achievement among 3,153 students from 124 schools in India ($r=.23$). And the level of teachers' credentials was the strongest predictor of student achievement within a sample of 463 primary school graduates in Uganda when tested against several other elements of school quality.

Very little evidence exists on the effectiveness of inservice teacher training programs (Indicator 2). This scarcity of knowledge is in stark contrast to the increasing level of resources invested in upgrading the skills of incumbent teachers. For instance, in the last decade two-thirds of the World Bank's education projects have included inservice teacher training components. Only four studies have examined the influence of such efforts. The strongest effect was found in a survey of 124 Indonesian secondary schools. Half the teaching staff in the arts stream had attended inservice training courses. For science teachers, participation was even higher. This factor was the second strongest school quality predictor of pupil achievement (bivariate correlations equalling .46 for arts and .35 for science). Within multivariate models, controlling for students' family background and many other quality elements, the frequency of inservice

training remained as a moderate predictor of student achievement. This factor was far stronger than the influence of pupils' family background [3.8].

Significant findings are reported in an earlier study in Indonesia within 40 fifth grade classrooms. The experimental design compared classroom groups which differed on textbook introduction and the level of inservice teacher training. The training "treatment" occurred independent of the introduction of textbooks. The former factor was significantly related to pupil achievement although the magnitude of the effect was weak, indicated in both the bivariate relationship ($r=.15$) and within a multivariate model. Inservice teacher training also was found to hold a significant association with achievement in Botswana and Egypt. Much more research is needed in this area, particularly as governments and development agencies invest a burgeoning amount of resources in trying to upgrade teachers' skills. The research to date finds that such initiatives do influence subsequent pupil achievement. But even less is known about what types of inservice programs are more effective and more efficient.

Only a few studies have examined how a teacher's skills relate to pupil achievement. Proxies such as the teacher's level of schooling or inservice training assume that additional competencies are obtained which subsequently increase pupils' achievement levels. More direct assessment of actual skills which are clearly related to the teacher's effectiveness is very rare. The school quality literature from industrialized countries, for instance, emphasizes the strength of teachers' verbal competence in boosting pupil performance (summarized in the annex). Work in the Third World is beginning to examine these types of teacher attributes. For instance, the previously mentioned study of 1,907 primary school students in Uganda found consistent and strong achievement effects from teachers' English proficiency on achievement in both language and mathematics achievement (Indicator 4). This factor influenced pupil performance more strongly than students' social class background, preschool ability, and two other school quality elements included in the model (comparing t-statistics). Teachers' achievement level (on a secondary school-leaving exam) was correlated with their pupils' performance in a study of 797 second grade students in Iran. The bivariate association was weak for the student sample overall ($r=.14$). However, within a multivariate analysis of students from rural and/or poor backgrounds, teachers' achievement level more strongly influenced their pupils' subsequent achievement.

The teacher's social class has been studied as a proxy for verbal and cognitive attributes which may influence achievement (Indicator 6). The argument is simply that teachers coming from more highly schooled families will be more effective teachers. For example, teachers' own verbal proficiency may enrich the quality of verbal interaction and cognitive stimulation experienced by their students. Teachers' social class is significantly associated with pupil achievement in 7 of 10 analyses. Seven of these analyses come from one study. The Latin American school quality survey included a single measure of social class background: level of schooling attained by the teacher's father. This factor was consistently related to the performance of teachers' own pupils in Peru, Bolivia, Paraguay, Argentina, and Brazil. In addition, the Chilean study of 3,530 grade 8 students found a significant, yet small, effect between teachers' social class and pupil achievement. The study of Iranian second grade

students mentioned above found a modest correlation between an index measuring the quality of teachers' secondary schools and their pupils' subsequent performance ($r=.19$). This factor remained significantly influential when included in a multivariate model.

Two alleged indicators of teacher quality hold little consistent influence in boosting achievement. Teacher experience did appear to make a significant difference in the early IEA survey, at least for reading teachers in Chile, India, and Iran (Indicator 3) [3.9]. However, work since then has led to more skeptical findings. A recent study of 869 students from 37 primary schools in Botswana found that the influence of teachers' experience rivalled the influence of father's occupation (used as a background control variable). Interestingly, a second study from Malaysia found that the length teachers' experience was associated with pupil achievement, but only among teachers receiving more preservice training courses. Nevertheless, 13 of 23 studies looking at teacher experience have found no significant achievement effect.

Similarly, teacher salary levels in general are not related to pupil performance (Indicator 5). Two recent analyses from Tanzania (2,803 secondary students) and Colombia (4,233 secondary students) found that higher achieving vocational students actually were taught by lower paid teachers. The negative influence of teacher salaries in Colombia was strong, exceeding the achievement effect of students' social class background and other elements of school quality. In contrast, an early school quality study of 115 secondary schools in Kenya found a significant effect for higher teacher salaries (with just three other quality elements in the model). As mentioned above, the researchers estimated the magnitude of this relationship, then determined the link between higher pupil achievement and future earnings. Both relationships were stronger for graduates from lower-income families. They estimated that additional investment in raising teacher salaries would yield a seven percent annual rate of return to graduates from poor families [3.10]. However, the rate of return was less than one percent for graduates of average social class background, despite the statistical significance of the association between teacher salary and pupil achievement.

Overall only 4 of 13 analyses have found an association between teacher salary levels and pupil achievement. The cost implications of increasing teacher salaries in general and of paying higher wages to teachers with longer tenure are enormous in developing countries. Given the limited achievement effect of salary level and experience, budget savings could be generated in this area and redirected to more promising elements of school quality. No detrimental effect on student achievement would likely occur.

Teaching Practices and Classroom Organization

Despite the burgeoning literature within industrialized countries on how teachers manage instructional resources and organize their classrooms, very little work has occurred within developing countries. Table 11 summarizing the findings of studies which have been conducted. The length of instruction stands out as a consistent predictor of student achievement (Indicator 1). This element of school quality suffers from inconsistent

Table 11
Efficacy of School Quality Elements:
Teaching Practices / Classroom Organization

(1) School Quality Indicator	(2) Hypothesis	(3) Country (School Level)	(4) Achievement or Economic Outcome Measured	(5) Direction of Effect			(6) Setting	(7) Study (Method)	
				+	0	-			
1. Length of instructional program	More hours or days of instruction will increase achievement	India (Primary)	Science	+				Heynean & Loxley	
		Iran		+					
		Thailand		+					
		Chile		+			Hours reading science text		
						+			Schiefelheim & Clavel (MR)
		Peru	Reading	+				Arriagada (1983)	
		Colombia		+				Arriagada (1981)	
		Colombia (Secondary)	Vocational knowledge	+			Hours spent on vocational instruction	Psacharopoulos & Loxley	
		Tanzania	Language & math (Academic students only)	+			Class time spent on science & social studies		
						0	Class time spent on language		
			(Vocational students only)	+	Number course periods in vocational area				
		Brazil (Primary)	Comprehensive exam	+		Rural schools Urban schools	Wolff		
2. Homework	Assignment and close evaluation of homework will boost learning	Botswana	Reading & math	+				Heynean & Loxley	
		Chile (Primary)	Reading & science	+		Biology homework	Thorndike (MR)		
		Chile (Secondary)	Language & math	+				Schiefelheim & Farrell (1973)	
		Tunisia (Primary/sec.)	Language	+			Urban students	Simons (MR)	
		Iran	Reading & science	+				Cooper & Keeses	
		India			0				
		Thailand			0				

3. Active teaching and learning roles in classrooms	Time spent explaining a lesson by the teacher will limit the student's own engagement in the material, lowering achievement	Peru (Primary)	Reading & science Math	0 0	Arriagada (1983)
	Classroom discussions will encourage active student learning and raise achievement	Botswana (Primary)	Reading & math	0	Loxley
4. High teacher expectations for student performance	Teachers who expect high achievement receive stronger commitment and performance from students	Hong Kong (Primary)	Language & math	+	Rome (CB)
		Uganda (Primary & sec.)	Comprehensive exam	+	Burojaiye (MR)
		Thailand (Primary)		+	Fuller & Chantavanich
5. Teacher's time spent on class preparation	More hours spent preparing for class will raise the quality of instruction and boost achievement	India (Primary)	Science	+	Heyneman & Loxley
		Iran		+	
		Chile		+	
		Thailand Botswana		0	
			Reading & math	+	Hours marking papers Loxley
6. Teacher evaluations of pupil performance	More frequent feedback to pupils and parents on achievement levels will encourage higher performance	Colombia	Science	+	Urban schools Arriagada (81)

definition and the use of varied measures, ranging from the number of days in the school year to how many hours science is studied during the school week. Yet in general, the length of instruction was significantly related to achievement in 11 of 13 analyses.

The length of instruction offered by schools is bounded, in part, by available material resources. Yet in many settings, the length of the school day, time spent on particular curriculum areas, and the efficient use of instructional time within classrooms is more strongly determined by management practices than by material parameters. Classrooms vary enormously in the amount of time actually spent on instructional tasks rather than keeping order, checking each student's homework, or arranging lessons. More efficient use of classroom time is strongly related to pupil performance within industrialized nations. Considerable progress on this potential source of school efficiency could be made -- by sharpening classroom management and teaching skills -- within existing levels of material inputs.

In Brazil, the study of primary school achievement introduced above (1,006 pupils) included a question for teachers on the length of their school day. This simple measure was significantly related to achievement in rural, but not urban schools. The influence of this indicator was modest, though similar to the magnitude of pupils' family background. Research in Colombian primary schools (826 sixth grade pupils) found that the hours of class per year moderately predicted reading achievement. This factor's strength was comparable to the significant influence of two measures of students' social class background. This same measure of instructional time also significantly affected reading achievement in a subsequent study of 324 grade 6 pupils in Peru. And the recent studies of secondary school achievement in Tanzania (922 academic students) and Colombia (4,233 pupils) found that the number of class periods spent in academic or vocational courses help predict performance on corresponding achievement exams. The strength of these instructional time measures usually exceeded the influence of pupils' social class background and were comparable in magnitude to other school factors.

Finally, Heyneman and Loxley's reanalysis of the IEA data on science performance revealed consistent achievement effects for different measures of instructional time. For instance, hours of instruction (per year) in general science were significantly associated with achievement in India, Thailand, and Iran. Hours of instruction in reading also helped predict achievement in Chile and India. This study did not estimate the magnitude of these instructional time effects; but the consistency of positive findings across different indicators and countries is notable.

The assignment of homework -- a second aspect of the organization of instruction -- also shows promise in raising student achievement (Indicator 2). The early IEA survey accounts for two analyses, where positive findings were reported in Chile and Iran (but not for India and Thailand). The magnitude of effect was small, although multivariate models simultaneously tested for possible effects of many school factors. One modest study of 83 urban Tunisian students found that reported conditions at home for studying were related to language achievement. This measure is not an indicator of teaching practices. But the factor was stronger than other school quality elements and equalled the magnitude of effects from

pupils' social class.

Additional mechanisms for encouraging higher student performance have received only slight attention from researchers working in developing countries. Two studies have examined the extent to which active learning roles are created for students in classrooms (Indicator 3). Self-reports by teachers of the amount of time they spent explaining academic material to students had no relationship to reading or math achievement within Peruvian primary schools. One recent study in Botswana (37 schools) found no relationship between the frequency of classroom discussions reported by teachers and achievement on national reading and math exams.

In contrast, the level of teacher expectations for higher pupil performance is related to their actual achievement in three independent studies (Indicator 4). For instance, the large survey of 23,555 third grade students in Thailand found a modest relationship between pupils' actual achievement and teachers' assessment of their "learning ability" ($r=.22$). This factor remained significant, though not strong, when entered into a multivariate model. Significant effects were also found by researchers in Hong Kong (stratified sample of 100 low and high achieving students) and Uganda (540 pupils from standards I, II, and III). However, the magnitude of these effects was comparable to findings from the Thai study.

Finally, alternative indicators of how much time teachers spend in class preparation have been used in two studies (Indicator 5). For example, analysis of the IEA data showed that the amount of time science teachers spent in preparing lessons (self-report) was significantly related to pupil achievement in Chile, Iran, and India, but not in Thailand. Three different measures were used: hours spent preparing lessons in and out of school, and hours spent marking papers. The latter measure was also used in the more recent Botswana study of 37 schools and standard 7 pupils. This factor was significantly related to both math and reading achievement. The magnitude of the effect was just statistically significant ($p<.05$). However, the full model included 10 student background variables and 17 school factors [3.11].

School Management and Structure

Beyond organization of the classroom, management of the entire school also represents an important component of school quality. The school's organizational structure drives the efficiency with which inputs are managed efficiently. The first four sets of school quality factors -- expenditures per pupil, specific material inputs, teacher quality, and teaching practices -- apply to various types of schools. Once a culture decides to formalize the socialization and training of their children, these four sets of quality elements are important in improving various types of schools. But this fifth school quality area -- management and organizational structure -- raises issues which at times are pertinent to particular kinds of schools. For instance, the structure of vocational schools may differ substantially from basic education in the rural primary school. In addition, the social rules which comprise management practices often are tied to the local culture or grow from social norms within the government sector. A hierarchical style of school management would be

viewed as desirable in some national contexts; a more participatory and professional school structure would be normative in other cultural settings.

Organizational structure refers to two features of schools. First, schools vary in terms of their goals. For instance, different schools emphasize vocational, academic, or artistic instruction. Also schools vary in their social goals. Headmasters may emphasize tightly disciplined classrooms which stress obedience, or instead stress more active roles for students and individual initiative by both teachers and pupils. Second, the management practices of headmasters can vary enormously, at times independent of the school's official goals. Headmasters employ a variety of means in supervising staff, in managing the school budget, in motivating teachers to improve their practices, in working with parents, or in disciplining errant pupils.

The "quality" of school management can be conceptualized within a unilinear framework. A principal acquires a variable level of skills and credentials necessary in becoming a strong leader and supervisor. Or "quality" of management can be view in a multidimensional way. For example, headmasters differ qualitatively on several aspects of school management: (a) whether they enforce a hierarchical power structure or encourage participation of teachers in addressing problems; (b) the frequency with which and how they evaluate teachers' performance in classrooms; (c) the extent to which they prescribe curricula to teachers or encourage different approaches and professional judgement; and (d) their competence in budgeting and accounting for material inputs.

Research on management practices of headmasters is blossoming within industrialized nations [3.12]. Unfortunately, very little is known about how headmasters in the Third World act to improve a school's instructional program. Table 12 summarizes the work that has occurred in developing countries. This research has largely employed proxies which presumably indicate the quality of a school's headmaster. For example, one recent study in Egypt of 60 primary schools found that students performed better in schools with principals that had attended more training courses and had longer teaching experience prior to becoming a principal (Indicator 1). This finding also appeared for science achievement among primary and secondary school students in Paraguay, coming from the Latin American school quality project. In each case, the principal's level of training was significantly related to achievement; the magnitude of these effects was not reported.

Stronger findings come from the Indonesian study of 124 secondary schools. Two characteristics of headmasters were among the strongest three school quality elements associated with pupil achievement levels. This inquiry found moderately high associations between pupil performance with both the headmaster's salary level ($r=.50$) and the headmaster's length of teaching experience ($r=.33$). Both factors remained strongly associated with achievement within a large model which estimated achievement from 13 student background factors and 17 other elements of school quality. The magnitude of these headmaster effects exceeded the significant influence of most student background factors (comparing t-statistics). The analysis failed, however, to explore whether these headmaster characteristics were acting as proxies for other aspects of school quality. The headmaster's

Table 12
Efficacy of School Quality Elements:
School Management and Structure

(1) School Quality Indicator	(2) Hypothesis	(3) Country (School Level)	(4) Achievement or Economic Outcome Measured	(5) Direction of Effect			(6) Setting	(7) Study (Method)
				+	0	-		
1. Quality of headmaster or principal	The principal's length of formal training will boost management and instruction-related skills, indirectly increasing achievement	Egypt (Primary)	Science	+				Heynean & Loxley
		Paraguay	Reading & science	+				
		Bolivia (Primary)				0	Urban schools	Morales & Pinellsiles
		(Secondary)				0	All schools	
		Botswana (Primary)	Reading & math			0	Headmaster's experience	Loxley
	Higher salaries will attract stronger principals, improve the instructional program, and raise achievement	Indonesia (Secondary)	Reading & math	+				Seabring & Livingston (NR)
2. Number of class shifts	More than one shift of classes each day will strain the effectiveness of resources and lower achievement	Egypt (Primary)	Literacy & numeracy		0			Hartley & Swanson
		Malaysia (Secondary)	Comprehensive exam	+				Beebout
		Chile (Primary & sec.)	Language & math			0		Schiefelbein & Farrell (1973)
3. Student boarding	Living at the school will raise student motivation and achievement	Kenya (Secondary)	Cambridge exam	+				Thias & Carnoy
		Tunisia	Grade point average	+				Carnoy & Thias
		Congo	Language & math	+				Youdi
		Malaysia	Comprehensive exam			0		Beebout
4. Student repetition	Holding low achieving students at a grade level will boost academic performance	Tunisia (Secondary)	Grade point average			-		Carnoy & Thias
		Egypt (Primary)	Reading & math exam			0		Hartley & Swanson
		Thailand	(Lowering) dropout rate				-	
		Brazil	Academic exam	+		0		Fuller & Chantavanich Costa

5. School monitoring	More frequent monitoring by the education ministry will improve instruction and raise achievement	Botswana (Primary)	Math Reading	+	0		Loxley
6. Student achievement information	National exams will improve school management, raising achievement	Kenya (Primary/sec.)	Comprehensive exam	+	0	In affluent schools In poorer schools	Somerset (CG)
7. Academic versus vocational curriculum	Tracking students into vocational curricula, where academic achievement is not emphasized, will lower student achievement	Chile (Secondary)	Level of first job	+			Schiefelbein & Farrell (1984)
		Colombia	Academic exam		0	For 3 of 4 vocational tracks	Psacharopoulos & Loxley (NR)
			Vocational exam		-	For 4 of 4 vocational tracks	
		Tanzania	Language & math	+		For 3 of 3 vocational tracks	
	Vocational curriculum will prepare youth more effectively for the labor force and will increase earnings	Colombia (Secondary)	Earnings (short-run)		0		Psacharopoulos & Zabalza (CG)
		Colombia	Rate of return (income)	+		Compared to academic track	Psacharopoulos (CO/CG)
		Philippines			-		
		Turkey			-		
		Thailand			-		
		Indonesia			-		
		Cross-national	National income		0	Over 1950-1970	Clark Benavot (NR)
8. School versus in-plant vocational training	In-plant training is more cost-effective	South Korea (Secondary)	Individual income	+			Lee (CG)

salary level holds no logical relationship to pupil achievement. Yet salary could be acting as a proxy for length of training or experience. This work does encourage deeper investigations into an important issue: What specific actions do headmasters engage in which indirectly affect student achievement?

In Bolivia, a study of 53 primary and secondary schools found a relationship between student achievement and the headmaster's length of tertiary schooling. The magnitude of this factor was comparable to the influence of expenditures per pupil in a simple model which included just seven other school quality factors. Each of these two significant predictors of achievement was stronger than the student's social class background (when comparing t-statistics). However, these results held only for urban, not rural schools. And the recent study in Botswana mentioned above found no effect from the the headmaster's years of experience among 37 schools enrolling grade 7 students. (Note, however, that values from only 37 cases were assigned to 869 pupils, constraining the variance in this headmaster-experience measure.)

Research has looked sporadically at other areas of school structure, including the number of class shifts each day and student boarding practices. An insufficient number of studies have occurred from which to generalize. However, two of three studies found no detrimental effect on achievement from the number of class shifts which operated each day (Indicator 2). In Malaysia (89 secondary schools), a negative achievement effect was observed where schools had two sessions of classes each day. However, the marginal achievement return from investing resources in eliminating double sessions was moderate. The researcher estimated that a \$100 investment toward reducing double sessions would yield a seven percent increase in language achievement. The analysis does not clarify whether this level of investment was affordable or even sufficient to eliminate double-sessions. This level of marginal effectiveness was higher than the benefits gained from investing in lower class sizes, but would yield a lower return than directing the same resources to improve teacher training.

Another area of school structure -- repetition of grade levels by low achieving students -- also holds significant cost implications (Indicator 4). Four analyses have examined whether repeting a grade improves performance in the long run. This is a difficult issue to model and study empirically. Yet positive effects been observed in just one study. The recent well designed study of 8,570 primary students in Egypt found no effect from grade repetition on pupils' academic achievement. Nor did repetition lower the probability of eventually dropping out of school, holding constant pupils' skill level.

The relative effectiveness of vocational versus academic curriculum is one piece of school structure which has generated considerable research. Table 12 includes a summary of this work (Indicators 7 and 8). This ingredient of school structure also has enormous cost implications. Third World governments and development agencies continue to invest in technical training schools and in vocational components of comprehensive (or diversified) secondary schools. However, earlier optimism that vocational training would raise student motivation, school achievement, and subsequent earnings has not be substantiated by the research. This element of school

structure relates to specific types of institutions. Since the present review focuses on elements of school quality which are present across various kinds of schools, the vocational issue will not be discussed in detail. For readers curious about this area, two recent publications review work which has been done this question [3.13].

A Narrow View of School Quality?

As a body of work, this collection of school quality studies is impressive. Over the past 15 years much has been learned about the influence of school quality in the Third World. The research has substantiated the importance of school quality in shaping achievement, net the influence of pupils' family background and community context. In addition, this literature has begun to delineate which specific school characteristics efficaciously boost student achievement.

But we should step back from this body of research and question its basic premises and weaknesses. A critical analysis is useful before applying research findings to investment strategies or local efforts designed to improve school quality. Questioning the research conducted to date may also prompt more refined investigations.

Here we summarize two sets of limitations. The first set comprise technical problems with how the basic production-function has been applied to output of learning. The second set raises more fundamental questions as to whether this model, borrowed from the process of material transformation, is even appropriate in trying to understand the social processes of teaching and learning.

Refining Production Functions. Early in this chapter the school quality literature was introduced by placing it in an historical context. Large scale school surveys were undertaken in developing countries to answer the basic question which still troubles industrialized societies: Do schools make a difference in shaping children's school achievement and eventual occupational attainment? The positive finding for developing countries importantly contradicts more limited effects within industrialized nations. But the methods employed to respond to this initial policy question are not always well suited to answer the second generation issue: Which specific elements of school quality effectively boost student achievement? This history constrains how we represent the process of teaching and learning within formal models and empirical studies. [In addition to the following discussion, the limitations of production function studies in education have been explored elsewhere, see Note 3.14.]

First, large scale surveys of easily countable school characteristics help in answering the original aggregate question, Do schools make a difference? But by including a grand number of school variables, the behavior and influence of a few characteristics are more difficult to study. The true influence of a particular school attribute may not be observed, given the simultaneous effects of other school factors. For instance, the study of Indonesia secondary schools found an overwhelming effect of the principal's level of training. But the functions typically included 45 different school characteristics. Thus the influence of other school characteristics were eclipsed by this strong proxy of principal

quality.

This suggests that production-function studies may be more useful in disconfirming that a certain school characteristic influences achievement, rather than identifying which elements are efficacious. Where production function studies include a large number of variables, the least ambiguous proxies of quality may show the most robust statistical findings. This occurs not because the school factor exerts the strongest influence. But this input may be more easy to measure. For instance, the teacher's level of training may simply be a proxy for verbal skill in the classroom. Yet quickly measuring the first is possible on a survey form. The second construct is more problematic to assess. On the other hand, the fact that class size (a discrete variable) rarely is related to student achievement is useful knowledge. In this way, the process of disconfirmation is easier within large scale production-function studies.

Second, large scale surveys also encourage the measurement of material aspects of schools. If there is pressure to gather data on a great number of variables from a large number of schools, material features can be more quickly counted. The assessment of underlying social and management processes is more problematic, including how teachers use textbooks, laboratories, or writing materials.

The recent experimental school quality studies in Nicaragua and the Philippines go very far in addressing weaknesses of production-function studies mentioned thus far. By focusing on a small number of school characteristics the relative magnitude of achievement effects can be more clearly determined. By looking just at the influence of additional textbooks and the introduction of radio instruction within specific schools, the research design controlled for the intervening influence of other school quality elements (assuming control-group schools were well matched). Concentrating only on these two quality inputs, the research group could then estimate the relative magnitude of discovered gains in achievement. Experimental designs also minimize the danger of inferring the wrong direction of causality which is present in correlational studies. It may be that more competent students attend higher quality schools, rather than higher quality schools actually increasing pupils' achievement. Cross-sectional data (from one point in time) can not fully rule out the first direction of causality). But with an experimental design, assessment of the school quality effect follows introduction of a discrete intervention within specific schools. Longitudinal surveys within the production-function framework would at least strengthen the case for the postulated direction of causality.

A third limitation of production-functions employed to date is the implicit assumption that each school characteristic behaves independently in shaping pupil achievement. But the interaction of two or more school characteristics is clear to any student of education. For instance, the influence of textbooks is bounded by the skills of teachers in using these materials. Interaction terms are commonly included within the production-function frame in other fields. This would be one step toward more realistic representations of the instructional process. Identifying the most efficient mix among several essential school characteristics may be more important than determining the independent influence of any one factor.

Fourth, typical models assume that school characteristics influence achievement in a linear fashion and that each can be substituted for another. Researchers often infer that a positive effect of, for instance lengthening the school day, is generalizable to all conditions. However, achievement gains would be constrained if teachers were not competent in effectively using additional instructional time. Investing more resources to lengthen the school day may have no influence on achievement until teachers' skills are upgraded. Here the influence of one school characteristic depends upon a threshold level of a second factor.

Production-function analysis could be improved to better capture the relative advantages of input mixes. In modeling agricultural production, for example, the relative efficiency of various input mixes (land, labor, and capital) often are compared in determining productivity advantages. Such work examines not only the magnitude of an input's effect on agricultural product but also its cost. In addition, farmers vary on their capacity to manage constant mixes of inputs. This resembles the management and organizational issues addressed below with regard to schools. The main point here: Education production-functions could look more carefully at the advantages of different mixes of inputs [3.15].

Fifth, researchers should be more careful in specifying the conditions under which findings apply. Large scale surveys invite inferences that certain school characteristics influence achievement across all settings. Little work has clarified under what specific conditions school factors do and do not shape pupil performance. An important exception to this general weakness: School quality elements (relative to family background) appear to exert a stronger influence in rural areas and among lower achieving students. Within relatively affluent urban areas, school quality effects diminish somewhat, though by no means entirely. This specification of the situation within which the finding applies is important. Yet beyond this consistently discovered conditionality, few studies systematically examine how quality effects may differ by grade level, academic area of study, or for different ethnic groups.

Finally, the traditional production-function literature rarely identifies the costs of various elements of school quality. This is particularly troublesome given policymakers need to determine which elements of quality effectively boost achievement and which are cost-effective. Again, the historical priority placed on establishing that schools do or do not have an effect has eclipsed concern over cost-effectiveness. Making schools more effective is somewhat independent of making schools more efficient. Both goals require establishing which school factors increase student achievement. But once efficacious elements of school quality have been identified, analysis of their relative costs is necessary. Chapter 4 will address the question of how school quality research can better look at this issue of cost-effectiveness or efficiency.

Abandoning material production-functions. The literature's historical context has led to a second, more serious, set of constraints. The production-function metaphor has encouraged study of material inputs which flow into the school rather than focusing on variability in the social organization of these inputs and in human behaviors which enhance or hinder learning. Within the production-function tradition the teaching-

learning process is defined simply as a system which combines material inputs to produce achievement. From this viewpoint, the production-function approach has ignored non-material behavioral aspects of school quality which can not be measured through large-scale surveys — especially how teachers and headmasters **manage and organize** material characteristics. This point of criticism suggests that the production-function framework be abandoned, replaced by new methods and a fresh set of school quality elements which may be more strongly linked to student achievement.

Rather than viewing the school as a firm which transforms material inputs, the school can also be viewed as an organization which manages material inputs with variable levels of efficiency. That is, the ways in which the headmaster manages school staff and how teachers arrange instruction significantly determine levels of student achievement. Material inputs clearly contribute to the quality of instruction and management of the school. But the emphasis here is on pin-pointing elements of the school's social structure which strongly influence achievement. For instance, research within industrialized countries consistently demonstrates that children learn more when more class time is spent on actual engagement in instructional tasks. In contrast, students often spend time talking to friends, idly waiting for the teacher to get organized, and sitting passively while the teacher checks the work of other children. Similarly, headmasters may be craftful in evaluating teachers' performance, in stimulating improvements, and in creating a sense of camaraderie among staff and students. Or the headmaster may remain in his or her office and attend to normal administrative tasks. But these elements of school quality are social in nature, not material. Material resources provide the instruments and simple technology necessary for effective instruction. But the use and management of these material inputs occurs through social practices.

This second line of research has been more fruitful in explaining student achievement within industrialized nations than has the study of material determinants. Several reviews of school quality research within industrialized countries have been conducted and are summarized in the annex. In general these reviews have found only a slight relationship between global measures of material inputs of school quality (for example, expenditures per pupil) and achievement, after controlling for the influence of community wealth and pupil background. Exceptions do arise. For instance, several studies in the U.S. found that the length of the school year does affect achievement. But in general, the level of material inputs fails to significantly boost pupil performance within industrialized settings.

School quality effects within industrialized countries are more robust when looking at social factors, including teacher quality, classroom structure, teaching practices, and school management. For example, empirical research frequently finds achievement effects stemming from the teacher's verbal ability, teacher experience, and level of teacher training. In developing countries, we have seen that material resource make a greater difference in raising achievement. But even in Third World countries, it appears that material inputs must be directly related to the instructional process to wield influence on pupil performance.

Regretably, little research on the management and social organization

of instruction is being conducted in the Third-World. Intellectual and resource constraints make surveys of material school features less costly (in the short run). Research on management and social factors — a relatively new field within industrialized countries — is slow to influence the older line of thinking. Third World research continues to follow the production-function form of investigation, even though this approach has been largely abandoned among investigators in industrialized countries.

Historical emphasis on material indicators of school quality may inadvertently discourage deeper examination of classroom practices. The school effects literature within industrialized countries currently focuses on two promising areas: (a) behaviors between teacher and student which are related to achievement gains, and (b) effective ways of organizing classrooms which encourage more active learning roles for students. For instance, the process of motivating students involves formulation by the teacher of concrete expectations for pupil performance, opportunities for the pupil to attack specific questions, and adequate evaluation of the student's performance by the teacher. Clearly material inputs (such as a book or writing pad) play a sizable role in Third World schools. But the structure of social action between teacher and student — and mobilization of these material inputs — exerts an independent force. And the management of material inputs can not be studied through large scale surveys.

A recent review summarizes several classroom-level studies which attempt to relate teaching practices and student achievement in developing countries. This work is still in an embryonic stage, limited by methodological problems and unconvincing evidence. Yet these early studies do enumerate several characteristics of teachers and ways of organizing classrooms which may help improve learning (Avalos & Haddad, Note 3.16).

Teacher's attributes and skills

1. Academic and intellectual proficiency
2. Creativity and inventiveness
3. Internal motivation for teaching
4. Participation in inservice teacher training
5. Teacher holds high expectations for student performance
6. Knowledge of subject matter
7. Teachers' beliefs about the purpose and utility of schooling

Classroom social structure and management

8. Teacher lectures at the class versus encourages questions and discussion with students
9. Learning occurs within cooperative groups versus individual study and competitive achievement
10. Lessons emphasize problem-solving skills versus subject matter
11. Teacher praises student achievement
12. School climate or organizational norms which encourage effort, trust, and mutual respect among students and teachers

Unfortunately, research on these non-material, social areas of school quality is just beginning. But attention to a subset of these factors and careful empirical research would be very helpful. Deliberate observations

of teachers and classroom organizations are necessary. Considerable progress within industrialized countries has occurred in defining and measuring these social factors with sufficient validity and reliability. Hard evidence is abundant on several of these social elements of school quality within industrialized countries. But the traditional production-function method must be adapted in studying these factors. A narrower and deeper focus on, for example, 40 varied classrooms would provide a wealth of data on the relative effectiveness of different teaching practices. This approach would move us far beyond looking only at proxies of quality; instead evidence would accumulate on specific behaviors of teachers and concrete ways of organizing classrooms which are empirically linked to higher student achievement [3.17].

Finally, materialist assumptions underlying the production-function framework ignore the symbolic dynamics of school quality. The body of research reviewed in this chapter stands upon the rationalist assumption that policymakers want to identify those elements of quality which increase student achievement. But attention to (or neglect of) improving school quality occurs within institutional contexts, be they governments or development agencies. And these institutions must necessarily be concerned with both the visibility and the perceived legitimacy of their actions. Early in this paper, the point is made that school expansion often receives more attention than improving quality. This may stem from the concrete and salient signals provided by the former. The sight of a new school building in a village or urban neighborhood is a powerful signal of "modernization" and change. Simply sending new textbooks into an old school is not as effective in symbolic and political terms.

Little thinking has occurred on how the project of improving school quality can incorporate more vivid signals of progress and come to be seen as a more legitimate initiative. The lack of political will, in part, stems from the lack of clear, effective signals that quality is important and possible within the context of national development. Reform of national examinations may be one device for making the issue of school quality more visible and for providing benchmarks for progress. China, Malawi, and Kenya recently have been considering improvements in their examination systems. Exams could become useful tools for mapping changes in student achievement, and even discovering what school factors appear to boost pupil performance. More concrete and public recognition of excellent teachers may be another way of building popular support for the improvement of school quality. Importantly, the task here centers on understanding how alternative elements of schools can send crisp signals, not which factors materially influence student achievement.

Summary

Two lessons from this review of empirical research should be emphasized. First, these 72 empirical studies have advanced our knowledge enormously on the question of which material school inputs do and do not raise student achievement. Investments on ineffective inputs by Third World governments and development agencies continue to be sizable. The corresponding loss in efficiency and waste of scarce educational resources is equally large. On the other hand, we know much about what works in schools. In particular, those material inputs that are closely linked to

the instructional process consistently influence achievement. -

Second, policymakers and researchers are becoming more clear on what we do not know. Among those school inputs which do shape achievement, we understand little about their relative costs and the magnitude of achievement benefits which they yield (that is, their relative efficiency). Also several studies show that the influence of school factors is strongest for children in the poorest countries and/or from lower-income backgrounds. But beyond this important condition, we know very little about the settings within which elements of school quality are more or less potent. Most importantly, we are largely ignorant of how headmasters and teachers manage material inputs. Differing forms of management and variation in classroom organization are apparent to most observers of Third World schools. But little empirical research has tried to relate these differing ways of organizing material inputs with levels of student achievement. Here work occurring within industrialized countries may contribute much to our eventual understanding of the organization of schools within developing countries.

Chapter 4

What School Characteristics Boost Efficiency?

Introduction

Research reviewed in Chapter 3 identifies the relative effectiveness of various elements of school quality. That review sorted out those school factors which help raise student achievement from those which do not. But among this former subset of efficacious school factors, very little is known about the efficiency with which these inputs raise student achievement. Wise investment decisions rest not only on understanding which school characteristics effectively boost achievement. In addition, understanding both the magnitude of achievement effects and the cost of alternative school characteristics could help boost the efficiency with which scarce school resources are allocated. This chapter reviews the few efficiency studies which have been conducted.

More efficient schools provide higher levels of achievement at constant, or ideally at lower, material cost. One way of achieving greater efficiency is to invest in those material elements of school quality which are most cost-effective or efficient. This requires choosing among various possible school inputs and practices. For instance, we now know with some certainty that textbooks and school libraries influence student achievement. Determination of which is the more efficient strategy for boosting achievement requires two additional pieces of information. First, we need to know how strongly textbooks versus school libraries influence pupil achievement. That is, the magnitude of each intervention's effect should be determined. Second, the cost of each strategy must be determined. Together these two variables — magnitude and cost — indicate the relative cost-effectiveness of investing in textbooks versus school libraries.

Building a school library, for instance, might boost student achievement 10 percent higher than would a doubling of available textbooks. Yet the former strategy may cost 50 percent more than the latter. Directing resources to textbooks, therefore, would be more cost-effective in raising achievement (per constant unit of investment).

Investing in those school factors which rarely correlate with higher achievement is very inefficient. In fact, resources allocated to ineffective material inputs or management practices could be reduced. This would generate cost-savings which could be redirected to more effective elements of school quality. Mentioned above, the research literature is most useful in identifying those school factors which hold no consistent influence on achievement, not necessarily in identifying what works. For instance, the consistent finding that (within reasonable limits) increasing class size does not diminish achievement is very important from an

efficiency standpoint. The cost-savings of even incremental increases in class size can be substantial.

This chapter speaks primarily to the issue of **internal efficiency**. The policy issue here: Given a limited level of material and human resources, can the school attain higher levels of student achievement? A second aspect of school efficiency deals with the relationship between the cost of schooling overall and students' subsequent streams of income. Schooling costs and eventual income benefits flowing to graduates vary greatly for different types of schools (for example, primary or secondary, vocational or academic). Therefore, schools differ on their external efficiency as well as their internal efficiency. A few studies reviewed below look at the relationship between school quality and eventual income effects experienced by graduates. This work crosses over the two spheres of school efficiency.

Sources of Internal Efficiency

The initial efficiency studies summarized here are just beginning to address the weaknesses of the production-function metaphor and model. This work necessarily (a) identifies the magnitude of the influence of a school quality factor on achievement, and (b) analyzes the cost of this element relative to the magnitude of its influence on achievement. However, weaknesses remain. Technical efficiency depends not only on selecting the right inputs and management practices; care must also be taken in creating efficient mixes of ingredients, as previously discussed.

Most troubling, the area of internal efficiency -- by emphasizing identification of costs -- ignores management practices and teaching behaviors for which prices are difficult to determine. For instance, when a headmaster successfully moves teachers to improve their method of instruction, student achievement gains may be significant. But conventional surveys neither capture this organizational behavior, nor can costs be readily assigned. A major challenge is to integrate conventional efficiency analysis with the study of management practices and social organization in schools. Otherwise, the study of internal efficiency will continue to focus only on material inputs.

Only a few studies have been completed which examine the internal efficiency of alternative school inputs or management practices. This research falls into three methods of analysis.

Method 1: General Comparison of Cost and Benefit

General comparisons between the relative costs and achievement benefits of school quality inputs can be quite revealing. For instance, one cost study in Bolivia found that achievement levels were no higher in schools with lower class size. This finding stems from a comparison of a random sample of 63 urban and rural schools (29 private and 34 public institutions). This does not rule out the possibility that the independent force of lower class size acts to improve achievement. School quality factors associated with higher class size could be exerting an offsetting influence to increase student performance (for instance, a critical

threshold level of textbook availability). But this lack of relationship between class size and achievement suggests that the allocation of additional resources to lower class size would not raise efficiency [4.1].

The Bolivian study also found that unit costs were 10 percent lower in private schools compared to public schools in both the fourth and twelfth grades. Reading scores among private school students were 40 percent higher in grade 4 and 30 percent higher in grade 12, compared to public school pupils. The difference in unit costs was more strongly linked to higher class size in private schools, not lower teacher salaries. In addition, the investigators found that the size of school enrollment held no effect on unit costs. Units cost were lower in schools with better qualified principals. More sophisticated models which look at the independent influence of various factors would be necessary to estimate unit costs. But these straightforward comparisons strongly suggest where cost-savings can be obtained and how some schools could become more efficient.

Simple evidence on the cost of school quality elements can also point to possible efficiencies. For instance, a study of (preservice) teacher training costs was conducted in Pakistan. The analysis included cost data from six of Karachi's colleges involved in teacher training and a survey of 400 recent graduates. Two findings are especially relevant. First, the unit cost of training one new teacher varied by a factor of six among the colleges. Cost accounting in education is not a precise science, nor are data reported on the graduates' average achievement level across these institutions (necessary in determining cost-benefit). Yet this wide variation in costs does suggest that some colleges are operating more efficiently than others.

Second, only 40 percent of the graduates were actually employed as teachers 13 months following their graduation from the training colleges. Over 55 percent were not working in any job. Despite a documented teacher shortage in this region of Pakistan, particularly in rural areas, many graduates were not teaching. Only 31 percent reported that they would be willing to teach in a rural area. Employment as a teacher was unrelated to their area of specialization in their training programs (for instance, mathematics, science, or language instruction).

These findings suggest a low overall level of efficiency in teacher training programs. The variation in unit costs also suggests that greater efficiencies are feasible within particular programs. Again, more careful analysis is necessary to see how teacher quality may covary with higher training costs. But this simple analysis of costs points to unambiguous inefficiencies [4.2].

The low efficiency of some teacher training programs was also revealed within the early Chilean study of school quality (grade 8 students within 439 classrooms) [4.3]. Whether teachers were trained in the university or normal schools was unrelated to student achievement. Yet university-based training was much more costly, in terms of direct cost of instruction and eventual salary levels. Based on actual cost data, the researchers estimated if only normal school graduates had been hired as teachers in the previous five years, a cost-savings equal to two percent of the national education budget would have been generated. In addition, the researchers

estimated that a 15 percent increase in average class size would have no diminishing effect on pupil achievement — and would free resources equal to five percent of the education budget. Moving to double shifts in schools, also unrelated to achievement levels, would create a cost-savings of an addition six percent of the sector's budget.*

Simple comparisons of costs and achievement benefits at times build from disconfirmation that a specific school factor has an effect on achievement. For example, the Bolivian analysis observed no association between higher unit costs and reading performance between public and private schools. The researchers then determined that variation in unit costs was better explained by the pupil/teacher ratio than by variation in salaries. The school quality literature already has found that class size makes little difference in shaping achievement levels. The advantage of both the Bolivian and Chilean studies is that they focus on the cost aspects of this ineffective element of school quality.

Method 2: Analysis of Discrete Marginal Cost and Product

More precise methods have been employed to estimate the cost-benefit of specific school quality elements. This approach has two advantages over general cost and benefit comparisons. First, the independent effect of a quality element is isolated either through an experimental design where an intervention is applied to a treatment group; the magnitude of the effect is then compared to the control group of classrooms or schools. Second, the cost of alternative quality improvements can be calibrated against a marginal increment (say a US\$ 100 investment in quality) in alternative school inputs (for instance, textbooks or lengthening the school day). The size of marginal products (or achievement benefits) can then be compared with the alternative investments, holding the marginal cost increment constant.

Experimental studies. The Nicaragua textbook and radio experiment discussed in Chapter 3 also included a cost-benefit analysis. Here the benefit or outcome variable utilized was the first grade passage rate among pupils receiving radio lessons in school versus students in the control classrooms. Among control-group students, an estimated 45 percent failed or dropped out before completing the first grade, versus 33 percent of students in the radio mathematics program (Table 14). The cost-savings (benefit) resulting from this lower failure rate was calculated. The overall cost per primary school student in Nicaragua at that time was \$54.00. The cost per first grade graduate, including resources expended on pupils who failed or dropped out, equalled \$99.50. By increasing the grade passage rate, the cost per graduate in the radio mathematics program approximated \$12.16 less than in the control classrooms. The per student cost of the intervention was \$3.00 per student.

Table 14
Nicaragua Radio Efficiency Study

	Nicaraguan Classrooms	
	With Radio Instruction	Without Radio Instruction (controls)
1. Mean math test score	52.5	37.6
2. Percent children failing grade 1	33%	45%
3. Cost per graduate from grade 1	\$87.34	\$99.50

Source: Jamison (1978); Jamison, Searle, Galda & Heyneman (1981)

Relative costs can also be calculated backwards, holding constant the increment of benefit (or achievement gain) which is observed. For example, students who received textbooks within the Nicaragua mathematics project scored .22 standard deviations higher than pupils in the control groups on tests given following the intervention. The cost per student of the textbook component of the project equalled \$2.00. This level of achievement gain was then calibrated against the magnitude of achievement gain which is observed when class sizes are lowered (based on U.S. literature). To accomplish this same magnitude of achievement gain, average class size must be lowered from about 40 to 10 students. Clearly the cost of this change would be enormous.

Multivariate survey studies. Experimental studies are rare in school quality research that is conducted in developing countries. The large scale survey, as discussed above, is more commonly used. The marginal product of incremental investments in elements of quality can be estimated from empirical models which attempt to report the independent influence of several factors. Based on a conventional production-function analysis (using a Cobb-Douglas model), the Malaysian study of 89 schools estimated the marginal gain in achievement associated with a constant level of new investment [4.4]. The researcher determined the cost of each element of school quality which significantly influenced achievement: level of teacher training, double sessions of classes, and class size.

The marginal gain in language test scores was then estimated for each \$100 increase in investment. Table 15 illustrates the various levels of effect found for this constant cost increment.

The production-function transformation provides information on the magnitude between a change in the school quality factor and the achievement effect (a one percent change in the independent factor leading to an X% change in achievement, depending upon the observed elasticity). The one percent change in the school quality element can be costed out. When calibrated against the \$100 increment in investment, the size of each achievement effect can then be estimated.

Table 15
Malaysia Efficiency Study

School Quality Element	Percent Gain in Language Test Score Per \$100 Investment
1. Teacher training	8%
2. Reduce use of double session	8%
3. Reduce class size	3%

Sources: Beebout (1972), Alexander & Simmons (1975)

This form of analysis first provides information on how strongly the quality improvement will boost achievement. In the Malaysian case, a \$100 increase in cost is very sizable given the moderate achievement effect observed. Second, the analysis indicates the relative efficiency with which alternative elements of quality will yield higher achievement, holding the cost increment constant.

One cost-benefit study pulled from both experimental and multivariate studies, comparing the relative efficiency of increasing instructional time, reducing class size, or using a pupil tutoring program to boost achievement. All data used in the analysis come from the U.S. The latter intervention involved tutoring of young children (grades 1-4) by older children (from grades 5 and 6). Several experimental and multivariate studies were reviewed to estimate the relative effect of the three school quality interventions. First, the effect sizes of each program on reading achievement gains are calculated in terms of standard deviation units (Table 16, Column A). Second, the cost per student per year is determined for each intervention (Column B). Third, the effect size is calibrated per \$100 increment of cost (for the base program, not for an additional increment of investment as with the Malaysia study).

This form of analysis provides information on the relative efficiency of different strategies for improving school quality. In addition, the unit cost data demonstrates which intervention is most feasible within fixed resources. For example, the peer tutoring program is very efficient. But within developing countries, this approach would be more feasible if its unit cost could be lowered.

Table 16
U.S. Efficiency Study (Reading)

School Quality Element	(a) Effect Size	(b) Cost Per Student	(c) Effect Size Per \$100 in Cost
1. Lengthen instructional time	.07	\$ 61	.12
2. Reduce class size (fm 35 to 20 pupils)	.22	\$201	.06
3. Peer tutoring	.48	\$212	.22

Source: Levin, Glass & Meister (1984)

Method 3: Estimating Rates of Return

Two studies which link school quality and achievement to graduates' subsequent earnings were discussed in Chapter 1. The recent study in Brazil found that school quality (measured by the length of teachers' schooling) more strongly influenced pupils eventual stream of income than did (pupils') length of school attendance. Similarly, the research in Kenya and Tanzania found that workers' earlier level of school achievement (measured with standardized literacy exams) also significantly influenced achievement. And a considerable body of research within industrialized countries demonstrates that the quality of school attended significantly affects graduates' eventual earnings [4.5].

Empirical data could be collected which (a) estimates the efficiency with which alternative elements of school quality influence achievement or literacy, and then (b) estimates how strongly levels of school achievement or literacy shape eventual earnings after leaving school. The early study of secondary school graduates in Kenya did undertake this type of two-step rate of return study. In part, the analysis reports on the relative efficiency of alternative school quality elements. Here the benefits are in terms of future earnings. The achievement gain associated with one school quality factor is seen as an intermediate factor which influences subsequent earnings. This work examined a limited number of school characteristics. But the method employed is important to note.

The analysis calibrated costs against a one-point increase in the national exam. For example, the cost of increasing the average test score by one point -- via an increase in per pupil expenditures -- was estimated at 31.25 (Kenyan) pounds per year (Table 17, Column A). The study also had found a significant achievement effect for higher teacher salaries. Assuming that this input measure was not acting as a proxy for another factor, the cost of boosting the average test score by raising salaries was estimated at 26.3 pounds per year. As reported in Chapter 3, lower achieving students (as a subgroup analyzed separately) realized a higher earnings benefit from higher school achievement. For instance, a one-point

gain in achievement was associated with a 15 pound per year difference in earnings, controlling on individual background factors (Column B). But for high achieving students (the second subgroup), a one-point gain in achievement was associated with only a 1 pound gain in earnings. The researchers then calculated rates of return by relating the cost of each element of school quality (per pupil expenditures and teacher salaries) with the realized earnings benefit. The intermediate process here is the school factor's influence on national exam scores. The calculated rates of return are reported in Column C.

Table 17
Kenya Rate-of-Return Study

School Quality Element	(a) Cost Per Year Per 1-point Gain (pounds)	(b) Earnings Benefit Per Year (pounds)	(c) Rate-of-Return
Lower Achieving Students			
1. Expenditures per pupil	62.50	15.00	5.0%
2. Teacher salary	52.60	15.00	7.2%
Higher Achieving Students			
1. Expenditures per pupil	62.50	1.00	0.4%
2. Teacher salary	52.60	1.00	0.5%

Source: Thias & Carnoy (1972)

Note that earning gains associated with each quality element are equal, given that the marginal cost of each quality element was calculated on the basis of a one-point gain in earnings. A one-point gain in the national exam is related to an equal gain in earnings regardless of which element of school quality determines that one-point increase.

This type of analysis is helpful in estimating the relative efficiency of different elements of quality, in terms of eventual gains in earnings. For instance, the influence of per pupil expenditures is somewhat greater than teacher salaries. In addition, this analysis can determine which students will benefit most from improvements in school quality. Here we see that quality investments at the margin will not significantly benefit pupils who are already achieving at relatively high levels.

Summary

Empirical research is now sufficient to determine which school factors are most consistently related to student achievement. However, among these efficacious elements of school quality, which factors most efficiently raise achievement? Very little empirical work has been conducted which focuses on this issue. We remain largely ignorant of both the magnitude of benefit (that is, pupil performance levels) rendered by alternative school inputs and management practices. Nor is much known about the relative costs of different inputs.

Yet the identification of internal inefficiencies is not always difficult. Simply knowing that a moderately higher class size or more limited use of classroom laboratories will not lower student achievement identifies where substantial cost-savings can be realized.

More precise methods for determining the efficiency of alternative school factors can also be employed. Care should, however, be taken to not only examine the efficiency of easily countable material inputs. Costs and achievement benefits are also associated with various ways in which schools are managed and classrooms are organized. The study of internal efficiency -- by policymakers, local school staff, and researchers -- should focus both on material inputs and organizational practices.

Annex / Review of School Quality Research from Industrial Countries

A brief review of school quality research from industrialized countries was undertaken. This exercise brought together several articles and books which have summarized the influence of school characteristics on student achievement. Since the Coleman and Plowden reports in the late 1960's, the school quality field has grown dramatically and broadened into a variety of specialized fields. The extent of Third World research, however, is considerably more modest. For developing countries it was useful to pull together the individual empirical studies which have been completed.

Table A-1 summarizes the several research reviews which apply to school settings in Western Europe or the U.S. Individual review papers, cited at the end of Table A-1, can be consulted for information on specific empirical studies.

Material Inputs

The influence of material inputs on achievement is inconsistent within industrialized countries. Even when a material variable influences pupil performance, the effect often is quite small. This is the case with smaller class sizes. One exception: schools with longer academic years tend to raise student achievement more efficaciously (at least within the U.S.).

Teacher Quality

The quality of teachers more consistently influences achievement. The most marked effects are for teachers' level of experience and verbal competence. Teacher salary levels appear to have little consistent influence on achievement. Mean salary levels within a school district, however, may determine its ability to attract staff with higher verbal skills.

Classroom Organization

Consistently positive achievement effects are found for several factors related to the organization and management of schools. Particularly potent classroom characteristics include time spent on instructional tasks, assignment and close evaluation of homework, placing students in active learning roles (not passively listening to lectures), tight evaluation of students' performance, and the teacher's clarity in presenting material.

Table A-1
 Influence of School Quality Elements on Student Achievement:
 Research from Industrial Countries

School Quality Element	Hypothesis	Evidence & Method	Study
A. MATERIAL INPUTS			
1. Expenditures per pupil	A higher level of resources will raise student achievement levels	MIXED effects found in three U.S. studies; POSITIVE effects found in two other studies, with expenditure operating indirectly via pupil/teacher ratio (Method:CS,NV Sig:DT Level:I,S,R)	Bridge, Judd & Moock (1979)
		NO or NEGATIVE effects found in 50 of 55 U.S. studies (Method:CS,NV Sig:DT Level:I,S,R)	Hanushek (1981)
		POSITIVE effects found for total instructional expenditures six models reported in four U.S. studies (Method:NV,CS Sig:DT Level:I)	Glasman & Binjaminov (1981)
		NO EFFECT found in four U.S. studies; POSITIVE effect found in one U.S. study (Method:NV,CS Sig:DT Level:I, S)	Janison, Suppes & Nells (1974)
2. Class size	Fewer students per teacher will improve the quality of instruction	POSITIVE effect of smaller class size found for science classes in Belgium, Germany, and the U.S.; NO EFFECT in six other industrial countries (Method:CS,NV Sig:DT Level:I)	Heyneman & Loxley (1983)
		POSITIVE effects found in 10 models estimated within five U.S. studies; NEGATIVE effect in two models report in same studies (Method:NV,CS Sig:DT Level:I)	Glasman & Binjaminov (1981)

		NO EFFECTS found in 100 of 109 U.S. studies reviewed (Method:CS,MV Sig:BT Level:I,S,R)	Hanushek (1981) Also reviewed in: Averch et al. (1974)
		NO EFFECT found for class size difference within the 20-40 students/teacher range within the U.S. and England; POSITIVE EFFECT for class sizes of less than 20 (Method:CS,MV Sig:BT Level:I,S)	Glass & Smith (1978) Rutter (1983)
		NO EFFECT found in comparing class size of Japanese and U.S. classrooms (Method:CS,CD Sig:BT Level:I,S)	Stevenson (1983)
3. School size	Smaller schools will increase the amount and quality of teacher-student interaction	NO EFFECT found in six U.S. studies (Method:CS,MV Sig:BT Level:I,S,R)	Bridge, Judd & Mook (1979)
		MIXED and inconsistent effects found in six studies reviewed from England and the U.S. (Method:MS)	Rutter (1983)
4. Instructional materials	Higher availability of textbooks and other instructional materials will boost the quality of learning activities, especially in reading instruction	POSITIVE effect found for the school's expenditures for books in Germany & Hungary; NO EFFECT found for nine other countries (Method:CS,MV Sig:BT Level:I)	Heyneman & Loxley (1983)
5. Length of school day/year	More total hours spent in school, on instructional activities will boost achievement	POSITIVE and consistent effects found in four U.S. studies (Method:CS,MV Sig:BT Level:I,S)	Bridge, Judd & Mook (1979)
6. Physical facilities	Better facilities provides better, more motivating conditions for learning	NO EFFECT found in 64 of 71 studies reviewed: (Method:CS,MV Sig:BT Level:I,S,R)	Hanushek (1981)
7. Library	Libraries provide higher levels and variety of reading materials	NO or MIXED EFFECT found in all eight U.S. studies reviewed (Method:CS,MV Sig:BT Level:I,S,R)	Bridge, Judd & Mook (1979)

B. TEACHER QUALITY

1. Pre-service training

More years of college instruction will boost teaching effectiveness

POSITIVE effect found for reading teachers in Hungary, New Zealand, and England; NO EFFECT found in ten other industrial nations
(Method:CS,NV Sig:DT Level:I)

Heyneman & Loxley (1983)

More years of graduate teacher-training will boost instructional skills

NO or NEGATIVE effects found in seven U.S. studies; POSITIVE effect found in two studies
(Method:CS,NV Sig:DT Level:I,S,R)

Bridge, Judd & Mook (1979)

2. Teacher experience

Teachers with longer tenure will develop stronger instructional skills

POSITIVE effects found in five U.S. studies; MIXED or NO effects found in five other studies depending on specific student achievement variable examined
(Method:CS,NV Sig:DT Level:I,S,R)

Bridge, Judd & Mook (1979)

POSITIVE, MODERATE effects found in review six U.S. studies; NO EFFECT in one additional study
(Method:CS,NV Sig:DT Level:I)

Janison, Suppes & Wells (1974)

POSITIVE effect found in 30 U.S. studies
NO EFFECT reported in 74 other examinations of this factor
(Method:CS,NV Sig:DT Level:I,S,R)

Manushak (1981)
Also reviewed in Averch et al. (1974)

POSITIVE effects found in all 23 models reported in eight U.S. studies
(Method:NV,CS Sig:DT Level:I)

Glasman & Binianinov (1981)

3. Teacher's verbal ability

Teachers with greater verbal skills will increase the quality of student-teacher interaction

POSITIVE effects found in four U.S. studies; MIXED or NO EFFECT found in three other researches
(Method:CS,NV Sig:DT Level:S)

Bridge, Judd & Mook (1979)

POSITIVE, MODERATE effects found for verbal skill of teacher, standardized test
(Method:CS,NV Sig:DT Level:I)

Janison, Suppes, Wells (1974)

4. Teacher salary

Higher salaries will attract better qualified people and more strongly activate teachers

POSITIVE effects found for teachers' verbal achievement from all 15 models reported in four U.S. studies
(Method:NV,CS Sig:BT Level:I)

Glasman & Biniaminov (1981)

NO or MIXED effects found in six U.S. studies
(Method:CS,MV Sig:BT Level:I,S,R)

Bridge, Judd & Mook

NO EFFECT found in 51 of 60 studies reviewed
(Method:CS,MV Sig:BT Level:I,S,R)

Hanushek (1981)

POSITIVE effects found in two U.S. studies
NO or NEGATIVE effects found in five other studies
(Method:CS,MV Sig:BT Level:I)

Janison, Suppes & Wells (1974)
Also reviewed in Glasman & Biniaminov (1981)

C. CLASSROOM STRUCTURE / TEACHING PRACTICES

1. Classroom time spent on instructional tasks

More time spent on concrete learning activities, versus time on disciplining students, managing records, or arranging lessons, will increase achievement

POSITIVE effect found for time reading science text in seven industrial nations;
NO EFFECT found in five other countries
(Method:CS,MV Sig:BT Level:I)

Heyneman & Loxley (1983)

POSITIVE effect found for hours of instruction spent per week on reading in Germany & Hungary
(Method:CS,MV Sig:BT Level:I)

Heyneman & Loxley (1983)

POSITIVE effect found for number of academic courses completed (versus vocational or elective courses) in national sample of U.S. students
(Method:MV Sig:BT Level:I)

Walberg & Shanahan (1983)

Assignment and close evaluation of homework will boost student learning

POSITIVE effects found in two British studies
(Method:CS,MV Sig:BT Level:S)

Rutter (1983)

2. Cooperative instructional tasks	Arrangement of and rewards with cooperative instructional tasks will increase interaction among students and subsequent learning	POSITIVE effect found in 29 evaluations of cooperative instructional tasks in the U.S.; NO EFFECT found in 21 other studies (Methods:EI,CO Sig:BT Level:I)	Slavin (1983) Also reviewed in Webb (1982)
3. High teacher expectations for student performance	Teachers who expect high standards of performance receive stronger commitment and achievement from students	POSITIVE effects found when teacher expectations are matched with effective classroom management and active learning exercises, U.S. studies (Methods:MV,CS,EI Sig:BT Level:I,S)	Brophy (1979) Malberg (1984)
4. Active teaching and learning roles	The level of interaction between teacher and student, and with learning materials, will increase student achievement	POSITIVE and consistent findings: the amount of time teachers spend interacting with the class, not only with individual students, is related to student achievement; efficacy of instructional materials in facilitating active learning remains unclear; British and U.S. studies (Methods:CS,MV Sig:BT Level:I,S)	Brookover et al. (1979) Rutter (1983)
5. Tight evaluation of student achievement	Close contingency between student effort and teacher rewards will boost student's motivation and achievement	POSITIVE correlation between students' perception that their classroom efforts were noticed and rewarded and their achievement in 120 U.S. schools (Methods:CS,MV Sig:BT Level:S)	Brookover et al. (1979)
		POSITIVE effect found for consistent recognition of high student performance (Methods: not specified in review)	Malberg, 1984
	A student's perception of efficacy and ability to influence the teacher or school structure may lead to higher motivation and achievement	POSITIVE effects found in four U.S. studies (Methods:CS,MV Sig:BT Level:I)	Bridge, Judd & Mook (1979)
6. Clarity of teacher's presentation	Clear explanations of material and will raise student comprehension & clarity of evaluation criteria	POSITIVE findings found in 50 studies reviewed from the U.S. (Methods:CO Sig:BT Level:I)	Rosenshine & Furst (1971) Also reviewed in Averch et al. (1974)

7. Individualized instruction

Curriculum which allows each student to progress at his/her own pace will increase mastery of material and student motivation

NO EFFECT found in 39 U.S. studies;
POSITIVE effects in 10 reports
(Method:EI Levels:I)

Bangert, Kulik & Kulik
(1983)

D. SCHOOL STRUCTURE

1. Academic vs. vocational curriculum

Tracking students into vocational curriculum, where academic achievement is not emphasized, will lower student performance

NEGATIVE effect of vocational track found in Scotland, New Zealand, Netherlands & Austria;
NO EFFECT found in nine other industrial nations (Method:CS,MV Sig:RS)

Heyneman & Loxley (1983)

2. Student tracking by competence level

Placing students in different tracks will hinder performance of students who are expected to perform at lower levels

MIXED effects found in nine studies from the U.S. and England
(Method:MS)

Rutter (1983)

3. School selectivity

Admitting more able students will encourage higher achievement standards

POSITIVE effects found: a school's student composition moderately effects the individual student's achievement, after controlling on the latter's family background; findings from eight British and U.S. studies
(Method:CS,MV Sig:BT Levels:I,S)

Rutter (1981)

4. Participatory management

Greater involvement of teachers in school decision-making will improve teacher motivation and commitment

POSITIVE effects found in British and U.S. studies
(Method:ET)

Rutter (1983)

5. Size of administrative staff	Adequate staff to deal with administration will improve quality of teaching and efficient use of resources	NO or MIXED effects found in six U.S. studies; POSITIVE effects found in just one study (Method:CS,MV Sig:BT Level:I,S,R)	Bridge, Judd & Mook (1979)
	Administrators with more training and from higher quality universities will more efficiently utilize resources	NO EFFECT found in 50 of 54 studies (Method:CS,MV Sig:BT Level:I,S,R)	Hanushek (1981)
6. Integration of school and work	More time spent in out-of-school work will lower school achievement	MIXED results from U.S. studies: moderate levels of work outside school may positively influence school commitment and achievement (Method:CS,MV Sig:BT Level:I)	D'Amico (1984)

* The following codes are used in Column 3 to signify the method of analysis used in specific studies.

METHOD's of analysis:

- CS = cross-sectional data from one point in time
- LG = longitudinal time-series data
- CO = simple correlational relationship
- MV = multivariate method used to control on family background, community wealth, or other antecedent determinants of school achievement
- EI = experimental design with classroom or school control groups
- ET = ethnographic case studies, often linking observed school characteristics with empirical data
- MS = method not specified in review article

Statistical importance or SIGNificance:

- RS = the factor explains at least five percent of the variance in school achievement measure
- BT = beta coefficient is significant at .10 level or better in regressions or at .05 level or better with bivariate correlations

LEVEL or unit of observation:

- I = individual student
- S = school
- R = region, community, or state
- N = aggregate national level

School Quality Reviews from Industrialized Countries

- Averch, H., Carroll, S., Donaldson, T., Kiesling, H. & Pincus, J. (1974) How Effective Is Schooling? Englewood Cliffs, N.J.: Educational Technology Publications.
- Bangert, R., Kulik, J. & Kulik, C. (1983) Individualized Systems of Instruction in Secondary Schools. Review of Educational Research, 53, 2, 143-158.
- Bridge, R., Judd, C. & Mook, P. (1979) The Determinants of Educational Outcomes: The Impact of Families, Peers, Teachers and Schools. Cambridge, Mass.: Ballinger.
- Brookover, W., Beady, C., Flood, P., Schweitzer, J. & Wisenbaker, J. (1979) School Social Systems and Student Achievement: Schools Can Make a Difference. New York: Praeger.
- Brophy, J. (1979) Teacher Behavior and Its Effects. Journal of Educational Psychology, 71, 733-750.
- D'Amico, R. (1984) Does Employment During High School Impair Academic Progress? Sociology of Education, 57, 152-164.
- Glasman, M. & Biniaminov, I. (1981) Input-Output Analyses of Schools. Review of Educational Research, 51, 4, 509-539.
- Glass, G. & Smith, M. (1978) Meta-analysis of Research on the Relationship of Class Size and Achievement. San Francisco: Far West Laboratory for Educational Research and Development.
- Hanushek, E. (1981) Throwing Money at Schools. Journal of Policy Analysis and Management, 1, 1, 19-41.
- Heyneman, S. & Loxley, W. (1983) The Effect of Primary School Quality on Academic Achievement across Twenty-nine High and Low-income Countries. American Journal of Sociology, 88, 6, 1162-1194.
- Jamison, D., Suppes, P. & Wells, S. (1974) The Effectiveness of Alternative Instructional Media: A Survey. Review of Research in Education, 44, 1, 1-67.
- Rosenshine, B. & Furst, J. (1971) Current and Future Research on Teacher Performance Criteria. In B.W. Smith (ed) Research on Teacher Education: A Symposium. Englewood Cliffs, N.J.: Prentice-Hall.
- Rutter, M. (1983) School Effects on Pupil Progress: Research Findings and Policy Implications. Child Development, 54, 1-29.
- Slavin, R. (1983) Cooperative Learning. New York: Longman.
- Stevenson, H. (1983) Comparisons of Japanese, Taiwanese, and American Mathematics Achievement. Stanford, Ca.: Center of Advance Study in the Behavioral Sciences.

Walberg, H. (1984) Improving the Productivity of America's Schools. Educational Leadership, 41, 8, 19-30.

Walberg, H. & Shanahan, T. (1983) High School Effects on Individual Students. Educational Researcher, 12, 7, 4-9.

Webb, N. (1982) Student Interaction and Learning in Small Groups. Review of Educational Research, 52, 3, 421-445.

Notes

Full citations to the studies listed below appear in the reference list (page).

Summary and Chapter 1

- 1.1 Dore (1976)
- 1.2 Unesco (1983a)
- 1.3 Egypt data, Hartley & Swanson (1984); Kenya, Somerset (1983); Brazil, Behrman & Birdsall (1983); Peru, Cespedes (1984).
- 1.4 de Regt (1982)
- 1.5 Heyneman & Loxley (1983); this issue is discussed in detail in Chapter 2.
- 1.6 For reviews see, Heyneman (1980) and Niles (1981).
- 1.7 Heyneman & Loxley (1983)
- 1.8 Heyneman, Jamison & Montenegro (1983)
- 1.9 Kravis (1984)
- 1.10 Schiefelbein & Farrell (1982, 1984)
- 1.11 Brazil study, Behrman & Birdsall (1983)
- 1.12 Distribution of educational benefits, Mingat & Tan (in press).
- 1.13 Boissiere, Knight & Sabot (in press)
- 1.14 Jamison & Mook (1984). Studies from industrialized countries on the economic effects of school quality are reviewed in Solmon (1985).
- 1.15 Fuller, Gorman & Edwards (in press)
- 1.16 Behrman & Birdsall (1983)
- 1.17 Fuller (1985)
- 1.18 Current work is looking at (a) the tradeoff between expanding enrollments versus increasing quality, in terms of expenditures per pupil, and (b) tradeoffs in investing among different school characteristics. For a draft paper, see Mingat & Tan (1984).
- 1.19 Unesco (1983a)
- 1.20 World Bank (1984)

Chapter 2

Many studies referred to within the text are clearly cited in Tables 8-12. Only papers not clearly identified in the narrative and tables are noted below.

- 2.1 For examples of this research, see Bing (1963), Hess & Holloway, (1984)
- 2.2 Mexico, Bowman (1984); Brazil, Armitage, Ferreira Gomez, Holsinger & Leite (1984).
- 2.3 This paper focuses only on the internal effectiveness and efficiency of schools. External efficiency is also an important issue related to school quality. That is, do elements of school quality influence the student's occupational success and social

- quality of life after leaving school? This question has spawned a large amount of research -- which will not be reviewed here.
- 2.4 For review, see Schiefelbein & Simmons (1981).
 - 2.5 Heyneman & Loxley (1983)

Chapter 3

- 3.1 My review builds from earlier summaries of the school quality literature. Especially helpful reviews include Simmons & Alexander (1978); Husen, Saha & Noonan (1978); Heyneman, Farrell & Sepulveda-Stuardo (1978); Schiefelbein & Simmons (1981).
- 3.2 Jamison, Searle, Galda & Heyneman (1981)
- 3.3 For examples, Thorndike (1973) and Rivarola & Corvalan (1976).
- 3.4 The cost-benefit analysis for Nicaragua appears in Jamison (1978).
- 3.5 Summarized in Heyneman & Loxley (1983).
- 3.6 The Chilean data are reported in Husen (1977). For Puerto Rico findings, see Carnoy (1971).
- 3.7 For review, Husen, Saha & Noonan (1978).
- 3.8 For a report on the World Bank's lending in education, see Romain (1974).
- 3.9 See Husen et al. (1978) and Heyneman & Loxley (1983).
- 3.10 The efficiency analysis appears in Thais & Carnoy (1973).
- 3.11 The IEA analysis is reviewed in Husen et al. (1978).
- 3.12 For reviews, see Edmonds & Frederiksen (1979), Rosenholtz (1985), Fuller, Izu & Berman (1985).
- 3.13 Metcalf (1985) and Psacharopoulos & Loxley (1985)
- 3.14 For examples, see Levin (1976) and Klees (1984).
- 3.15 Noted earlier, initial results of ongoing work is reported in Mingat & Tan (1985).
- 3.16 Avalos & Haddad (1981)
- 3.17 For reviews of reliable measures of observable teaching and classroom management practices, see Flanders (1985), Karweit (1985), and Peterson, Micceri & Smith (1985).

Chapter 4

- 4.1 For the Bolivian analysis, see Morales & Pinellsiles (1977). For an efficiency study of class size reduction, see Jamison (1982).
- 4.2 Klitgaard, Siddiqui, Arshad, Niaz & Khan (1985)
- 4.3 This efficiency analysis for Chile is detailed in Farrell & Schiefelbein (1974).

References

Complete citations for papers indicated in Table A-1 directly follow the table and do not appear below.

- Armitage, J., Ferreira Gomes, J., Holsinger, D. & Helio Leite, R. (1984) School Quality and Achievement in Rural Brazil (draft mimeo). Paper presented at the World Bank, November.
- Arriagada, A. (1981) Determinants of Sixth Grade Student Achievement in Colombia (Mimeo). Washington, D.C.: The World Bank, Education Department.
- Arriagada, A. (1983) Determinants of Sixth Grade Student Achievement in Peru (Mimeo). Washington, D.C.: The World Bank, Education Department.
- Avalos, B. & Haddad, W. (1981) A Review of Teacher Effectiveness Research. Ottawa: International Development Research Centre.
- Balderston, J., Wilson, A., Freire, M. & Simonen, M. (1981) Malnourished Children of the Rural Poor. Boston: Auburn House.
- Beebout, H. (1972) The Production Surface for Academic Achievement: An Economic Study of the Malaysian Secondary Education. PhD dissertation, University of Wisconsin.
- Behrman, J. & Birdsall, N. (1983) The Quality of Schooling: Quantity Alone is Misleading. American Economic Review, 73, 5, 928-946.
- Benavot, A. (1982) "Secondary Schooling and the Impact of Vocational Education on Economic Development." Paper read at Midwest Sociological Association, Des Moines, Iowa.
- Bibby, J. & Peil, M. (1974) Secondary Education in Ghana: Private Enterprise and Social Selection. Sociology of Education, 47, 399-418.
- Bing, E. (1963) Effects of Child Rearing Practices on Development of Differentiated Cognitive Abilities. Child Development, 34, 631-648.
- Birdsall, N. (in press) Public Inputs and Child Schooling in Brazil. Journal of Development Economics.
- Boissiere, M., Knight, J. & Sabot, R. (in press) Earnings, Schooling, Ability, and Cognitive Skills. American Economic Review.
- Bowman, M. (1984) An Integrated Framework for Analysis of the Spread of Schooling in Less Developed Countries. Comparative Education Review, 28, 4, 563-583.

- Carnoy, M. (1971) Family Background, School Inputs, and Students' Performance in School: The Case of Puerto Rico (Mimeo). Palo Alto: Stanford University.
- Carnoy, M. & Thias, H. (1974) Second Tunisia Education Research Project (draft mimeo). Washington, D.C.: The World Bank.
- Cespedes, A. (1984) Peru Primary Education Project: Staff Appraisal Report. Washington, DC: World Bank.
- Clark, D. (1983) How Secondary School Graduates Perform in the Labor Market: A Study of Indonesia (SWP No. 615). Washington, D.C.: The World Bank.
- Comber, L. & Keeves, J. (1973) Science Education in Nineteen Countries. New York: Halstead Press.
- Costa, M. (1977) School Outputs and the Determinants of Scholastic Achievement: An Econometric Study of Urban Schools in Sao Paulo (Mimeo). Stanford, Calif.: Stanford University.
- Currie, J. (1977) Family Background, Academic Achievement and Occupational Status in Uganda. Comparative Education Review, 21, 14-27.
- de Regt, J. (1982) Haiti: Staff Appraisal Report (Basic Education Project). Washington, DC: World Bank.
- Dore, R. (1976) Human Capital Theory, the Diversity of Societies and the Problem of Quality in Education. Higher Education, 5, 79-102.
- Drysdale, R. (19) Factores Determinantes de la Desercion Escolar en Colombia. Revista del Centro de Estudios Educativos.
- Durojaiye, M. (1974) The Role of Non-cognitive Factors in School Learning of Uganda Secondary School Pupils. West African Journal of Educational and Vocational Measurement, 2, 1, 35-39.
- Echart, E., Meir, J., Manuelli, R. & Binimelis, M. (1976) Los Determinantes de la Educacion en Argentina. Buenos Aires: ECIEL.
- Ellson, D. (1973) "Programmed Teaching: Effective Teaching by 'Unqualified Teachers'." In T. Husen et al. (1978).
- Farrell, J. & Schiefelbein, E. (1974) Expanding the Scope of Educational Planning: The Experience of Chile. Interchange, 5, 18-30.
- Flanders, N. (1985) Human Interaction Models of Teaching. In T. Husen & T. Postlethwaite, International Encyclopedia of Education (Volume 4, F-H). Oxford: Pergamon Press.
- Fuller, B. (1985) School Quality Trends in the Third World (mimeo). Washington, DC: World Bank, Education & Training Department.

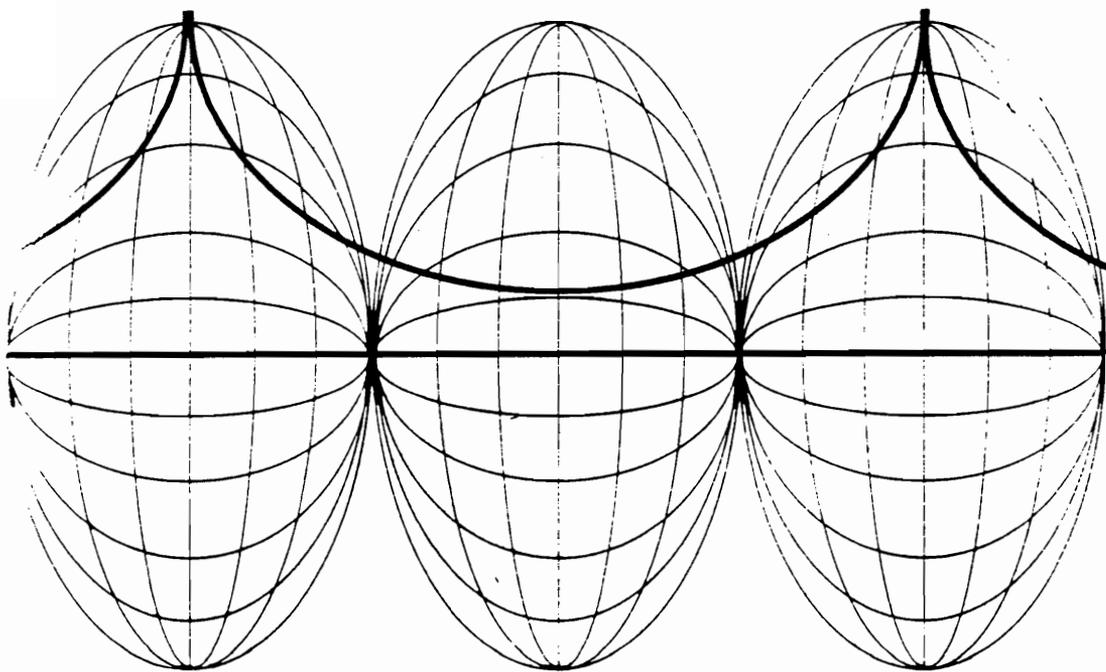
- Fuller, B., Izu, J. & Berman, P. (1985) Explaining School Cohesion: What Shapes the Organizational Beliefs of Teachers? (mimeo). University of Maryland.
- Fuller, B., Gorman, K. & Edwards, J. (in press) The Influence of School Investment Quality on Economic Growth: An Historical Look at Mexico, 1880-1940. In S. Heyneman & D. Siev White (ed) The Quality of Education in Developing Countries. Washington, D.C.: The World Bank.
- Fuller, W. & Chantavanich, A. (1976) A Study of Primary Schooling in Thailand: Factors Affecting Scholastic Achievement of the Primary School Pupils. Bangkok: Office of the National Education Commission.
- Haddad, W. (1978) Educational Effects of Class Size (SWP No. 280). Washington, D.C.: The World Bank.
- Haron, I. (1977) Social Class and Educational Achievement in a Plural Society: Peninsular Malaysia (Doctoral Dissertation). Chicago: University of Chicago.
- Hartley, M. & Swanson, E. (1984) "Achievement and Wastage: An Analysis of the Retention of Basic Skills in Primary Education" (Draft). Washington, D.C.: The World Bank, Development Research Department.
- Hess, R. & Holloway, S. (1984) Family and School as Educational Institutions. In R. Parke (ed) Review of Research in Child Development.
- Heyneman, S. (1976) Influences on Academic Achievement: A Comparison of Results from Uganda and More Industrialized Societies, Sociology of Education, July.
- Heyneman, S. (1980) Differences Between Developed and Developing Countries: Comment on Simmons and Alexander's "Determinants of School Achievement." Economic Development and Cultural Change, 28, 2, 403-406.
- Heyneman, S. & Jamison, D. (1980) Student Learning in Uganda: Textbook Availability and Other Factors. Comparative Education Review, 24, 206-220.
- Heyneman, S. & Loxley, W. (1983) The Effect of Primary School Quality on Academic Achievement across Twenty-nine High and Low-Income Countries. American Journal of Sociology, 88, 6, 1162-1194.
- Heyneman, S., Jamison, D. & Montenegro, X. (1983) Textbooks in the Philippines: Evaluation of the Pedagogical Impact of a Nationwide Investment. Educational Evaluation and Policy Analysis, 6, 2, 139-150.
- Husen, T. (1977) "Pupils, Teachers, and Schools in Botswana: A National Evaluation Survey of the Primary and Secondary Education." Gaborone: Government Printing Office.
- Husen, T., Saha, L. & Noonan, R. (1978) Teacher Training and Student Achievement in Less Developed Countries (SWP 310). Washington D.C.: The World Bank.

- Izquierdo, C. & Guzman, J. (1971) Una Exploracion de los Factores Determinantes del Edimento Escolar en la Educacion Primaria. Revista del Centro de Estudios Educativos, 1, 2, 7-27.
- Jamison, D. (1978) Radio Education and Student Repetition in Nicaragua. Washington, D.C.: World Bank (Reprint Series No. 91).
- Jamison, D. (1982) Reduced Class Size and Other Alternatives for Improving Schools: An Economist's View. In G. Glass, L. Cahen, M. Smith & N. Filby, School Class Size: Research and Policy. Beverly Hills, Calif.: Sage.
- Jamison, D. & Mook, P. (1984) Farmer Education & Farm Efficiency in Nepal. World Development, 12, 1, 67-86.
- Jamison, D., Searle, B., Galda, K. & Heyneman, S. (1981) Improving Elementary Mathematics Education in Nicaragua: An Experimental Study of the Impact of Textbooks and Radio on Achievement. Journal of Educational Psychology, 73, 4, 556-567.
- Karweit, N. (1985) Should We Lengthen the School Term? Educational Researcher, June/July.
- Klees, S. (1975) Television and Other Determinants of Scholastic Achievement in Mexican Secondary Education (Mimeo). Ithaca, N.Y.: Cornell University, Economics Department.
- Klees, S. (1984) The Need for a Political Economy of Educational Finance. Comparative Education Review, 28, 3, 424-443.
- Klitgaard, R., Siddiqui, K., Arshad, M., Niaz, N. & Khan, M. (1985) The Economics of Teacher Education in Pakistan. Comparative Education Review, 29, 1, 97-110.
- Lee, C. (1985) "Financing Technical Education in LDC's: Economic Implications from a Survey of Training Modes in the Republic of Korea." Washington, D.C.: Education Department, The World Bank.
- Levin, H. (1976) Concepts of Economic Efficiency and Educational Production. In J. Froomkin, D. Jamison & R. Radner, Education as an Industry. Washington, DC: National Bureau of Economic Research.
- Levin, H., Glass, G. & Meister, G. (1984) Cost-Effectiveness of Four Educational Interventions (mimeo). Stanford, Calif.: Institute for Research on Educational Finance and Governance.
- Levy, M. (1971) Determinants of Primary School Dropouts in Developing Countries. Comparative Education Review, 15, 1, 44-58.
- Loxley, W. (1984) Quality of Schooling in the Kalahari (Mimeo). Paper read, Comparative and International Education Society, Houston.
- Metcalf, D. (1985) The Economics of Vocational Training (SWP 713). Washington, DC: World Bank.

- Mingat, A. & Tan, J. (1984) On the Quantity-Quality Tradeoff in Education (draft mimeo). Washington, DC: World Bank, Education & Training Department.
- Mingat, A. & Tan, J. (in press) Who Profits from the Public Funding of Education? Comparative Education Review.
- Morales, J. & Pinellsiles, A. (1977) The Determinant Factors and the Costs of Schooling in Bolivia (Working Paper No. 4-77). La Paz: Universidad Catolica Boliviana.
- Nasoetion, N., Djalil, A., Musa, I. & Soelistyo, S. (1976) The Development of Education Evaluation Models in Indonesia. Paris: International Institute for Educational Planning, Unesco.
- Niles, F. (1981) Social Class and Academic Achievement: A Third World Reinterpretation. Comparative Education Review, 25, 419-430.
- Peterson, D., Micceri, T. & Smith, O. (1985) Measurement of Teacher Performance: A Study in Instrument Development. Teaching and Teacher Education, 1, 1, 63-77.
- Psacharopoulos, G. (1973) Returns to Education: An International Comparison. San Francisco: Jossey-Bass.
- Psacharopoulos, G. & Loxley, W. (in press) Diversified Secondary Education and Development. Washington, D.C.: The World Bank, Education Department.
- Psacharopoulos, G. & Zabalza, A. (1984) The Destination and Early Career Performance of Secondary School Graduates in Colombia. Washington, D.C.: The World Bank.
- Purves, A. (1973) Literature Education in Ten Countries. Stockholm: Almqvist & Wiksell.
- Rivarola, D. & Corvalan (1976) Determinante del Rendimiento Educativo en el Paraguay (Mimeo). Asuncion: ECIEL.
- Romain, R. (1984) Lending in Primary Education: Bank Performance Review FY 1963-83 (draft mimeo). Washington, DC: World Bank.
- Rosenholtz, S. (1985) Effective Schools: Interpreting the Evidence. American Journal of Education, May, 352-388.
- Rowe, E., Lau, G., Lee, G., Li, A. & Rodd, R. (1966) Failure in School: Aspects of the Problem in Hong Kong. Hong Kong: Hong Kong University Press.
- Ryan, J. (1973) Educational Resources and Scholastic Outcomes: A Study of Rural Primary Schooling in Iran. PhD Dissertation, Stanford University.
- Schiefelbein, E. & Clavel, C. (1977) Stability Over Time of Educational Input-Output Relationships (Mimeo). Santiago: University of Chile, Economics Department.

- Schiefelbein, E. & Farrell, J. (1973) Factors Influencing Academic Performance among Chilean Primary Students (Mimeo). Santiago: Centro de Investigaciones y Desarrollo de la Educacion.
- Schiefelbein, E. & Farrell, J. (1982) Eight Years of Their Lives: Through Schooling to the Labour Market in Chile. Ottawa: International Development Research Centre.
- Schiefelbein, E. & Farrell, J. (1984) Education and Occupational Attainment in Chile: The Effects of Educational Quality, Attainment, and Achievement. American Journal of Education, 125-162.
- Schiefelbein, E. & Simmons, J. (1981) Determinants of School Achievement: A Review of Research for Developing Countries (mimeo). Ottawa: International Development Research Centre.
- Sembiring, R. & Livingstone, I. (1981) National Assessment of the Quality of Indonesian Education. Jakarta: Ministry of Education and Culture.
- Silvey, J. (1972) Long Range Prediction of Educability and Its Determinants in East Africa. In L. Cronbach & P. Drenth (eds.) Mental Tests and Cultural Deprivation. Paris: Mouton Publishers.
- Simmons, J. (1970) Towards an Evaluation of Adult Education in a Developing Country (Volumes 1 and 2). Paris: Unesco.
- Simmons, J. & Alexander, L. (1978) The Determinants of School Achievement in Developing Countries: A Review of the Research. Economic Development and Cultural Change, 26, 2.
- Smart, M. (1978) The Densu Times: Self Made Literacy. Development Communication Report, 21.
- Solmon, L. (1985) Quality of Education and Economic Growth. Economics of Education.
- Somerset, H. (1968) Predicting Success in School Certificate: A Uganda Case Study. Nairobi: East Africa Publishing House.
- Somerset, H. (1983) Examinations Reform: The Kenya Experience (mimeo). Sussex: University of Sussex, Institute of Development Studies.
- Thias, H. & Carnoy, M. (1973) Cost Benefit Analysis in Education: A Case Study of Kenya. Baltimore: Johns Hopkins Press.
- Thorndike, R. (1973) Reading Comprehension in Fifteen Countries. New York: Halsted Press.
- Windham, G. (1970) Occupational Aspirations of Secondary School Students in Sierra Leone. Rural Sociology, 35, 1, 40-53.
- Unesco (1983a) Trends and Projections of Enrolment by Level of Education and by Age, 1960-2000. Paris: Office of Statistics.

- Unesco (1983b) Statistical Yearbook, 1983. Paris: Office of Statistics.
- Wolff, L. (1970) Why Children Fail in First Grade in Rio Grande do Sul: Implications for Policy and Research. Washington, D.C.: U.S. Agency for International Development.
- World Bank (1984) World Development Report, 1984. Washington, DC & New York: Oxford University Press.
- Youdi, R. (1971) An Exploratory Study of Achievement and Attitudes of High School Students in the Congo: An Aspect of Socialization for National Development. PhD Dissertation, Stanford University.



B • R • I • D • G • E •

Basic Research and Implementation
in Developing Education Systems

CASUAL PAPERS

EFFECTIVE CLASSROOM PRACTICES
IN PRIMARY SCHOOLS OF PAKISTAN

by Andrea B. Rugh

Harvard University, BRIDGES Project

Papers on Primary Education in Pakistan. Report # 8. 1989.

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Preliminary draft for
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June 28, 1989.

EFFECTIVE CLASSROOM PRACTICES
IN PRIMARY SCHOOLS OF PAKISTAN

by Andrea B. Rugh

Research in the United States and developing countries over the last two decades has shown the importance of teaching practices in instruction.¹ Most studies agree that the effectiveness of pedagogical style varies so widely from place to place that no single pedagogy can be taken as a definitive model for policy.

The purpose of the classroom practices study is to identify the elements--resources and instructional behaviors, which contribute to learning in Pakistani schools. The objective is to describe current practices and conditions, and to identify those practices which seem to produce increased academic achievement under presently existing conditions. The following report provides preliminary findings of the study. It describes the instructional practices of a sample of effective teachers² including, in a separate section, the way effective teachers utilize instructional time. When the report is complete it will also include sections describing the attributes and attitudes of effective teachers and a section on the resource environment--in schools and classrooms-- where effective teachers work. The aim is to identify those characteristics of effective schools, which when compared with those where less effective teachers teach, provide clues to what may be useful resource requirements of the instructional context. Altogether the full report will form a nested set, in rough order of specificity, from the attributes of teachers, through their methods and performance in the classroom to, finally, the context of the classrooms and schools in which they work.

Background

In recent decades, many developing countries have experienced a similar history with education programs. A late start in trying to universalize educational opportunities and a rapidly expanding

school age population causes authorities to commit the major part of educational resources to expanding and staffing physical facilities. With strong pressures to expand, there is a reluctance to engage in major improvements in the quality of programs. Contributing to this reluctance is the lack of certainty about what interventions are likely to improve quality. Eventually and almost inevitably, with the strains of expansion, the quality of programs deteriorates until improvements of some kind become crucial if children are to be kept long enough in school to consolidate the gains of expanded opportunities.

Pakistan has been experiencing these problems for some time. According to the latest 1981 census, Pakistan's literacy rate of those 10 years and above was 26 percent. At that time there were 13.41 million children in the age range 5 to 9, and another several million age 10. In 1984-85, 7 million students were enrolled in 82,550 primary schools in Pakistan. The gross participation rate for boys, ages 5 to 9 in grades 1-5 was estimated officially at about 79 percent and the respective rate for girls was 42 percent.

Pakistan has had difficulty keeping up with the rapidly increasing demand for education. Though overall proportions of relevant age children enrolling in school have been maintained in the last 20 years (2 percent increase between 1965-1984 according to the World Bank Development Report 1987), with an annual average growth rate in population of 3.1 over the period, the absolute number of out-of-school children has increased. Boys' rates of school age children enrolled in primary school during the period declined from 59 to 54 percent, while girls' rates increased from 20 to 29 percent. The major part of the current education budget is now spent on the recurrent costs of the system with little left over to expand further or to invest in major improvements of the program.

Compounding the problem is the fact that dropout rates remain persistently high, especially for rural children and females. In 1983-84, dropout rates for primary school children ranged from a low of 18 percent in Punjab for males in urban areas, to a high of 93 percent for females in Baluchistan. In 1985 only about a third of five year old rural girls (940,000) were in school, and only about half of those who entered school were expected to finish the fifth grade. By age 12, only about 4 percent of rural girls are still in school.

Almost every education planning document since 1947 has noted the serious problem of dropouts. The Commission on National Education in 1959 implied that the problem might be solved if education were to be made compulsory up to grade 5 by 1969. The 1970 New Education Policy document similarly expressed alarm at the high dropout rates. That document called for more attractive schools to motivate children to remain in school. A 1972

document called for revision of curricula and texts, and a 1979 document called for a number of efforts including improved facilities, better supervision and new ways of recruiting teachers to reduce the high dropout rates. All the five year plans since 1960 have called for qualitative improvements in the education program, sometimes stressing the quality of the school environment, at other times emphasizing instructional materials, teacher training, or supervision.

The World Bank in its Education Sector Strategy Report concludes that given the current rate of wastage in the Pakistani primary system, future measures which keep more children in school will be as important as measures to draw more children into the school system if literacy levels are to be increased substantially. No matter how large the infusion of funds in the near future from increased GOP and foreign donor contributions, it will be inevitable in the future that economies and efficiencies will have to be made in the way funds are currently used.

Though there are major difficulties in determining what precise interventions are likely to lead to improvements in program quality, the task is not impossible. There are a limited number of inputs which a government can provide to improve program quality. The four most important are minimally required facilities, trained competent staff, appropriate instructional materials, and sufficient and well-utilized instructional time. When these components are well-developed and articulate well, the likelihood that the quality of teaching/learning will improve is increased. When they are poorly developed and do not articulate well, then instructional quality is likely to suffer. The following sections describe some of these crucial components in a sample of Pakistani schools.

Section 1: Instructional Practices

The section below summarizes the findings concerning instructional practices in classrooms. It describes the differences in instructional practice between a sample of effective and less effective teachers as measured by researcher-administered academic achievement tests. The assumption of this analysis is that characteristics which are present to greater degree in the effective sample may prove supportive of increased academic performance if replicated in other similar environments.

The first section of the paper asks the following questions:

- o What are the main instructional practices used by teachers in fourth and fifth grade classrooms?
- o Which practices may be considered potentially "effective," because they distinguish, by their greater frequency between

a sample of effective and less effective teachers?

o To what extent do these effective practices emulate explicit teaching practices found over a decade of research to increase learning in other national contexts?

The body of this paper describes the practices used by teachers of the effective and less effective samples. The conclusions at the end of the section summarize the findings in a form which answers the questions posed above.

The unit of analysis for this section is an observation of a classroom lesson in any one of three subject matters: Urdu, math or science. Observations were conducted in fourth and fifth grade classrooms on the second and third day of visits to the sample schools. Altogether there were 264 valid observations.

Researchers administered math, science and Urdu tests, and teachers were divided into more effective and less effective samples on the basis of the average class scores from these tests. These samples superceded original selection criteria based on supervisor rankings of teachers.

Table 1 shows the distribution of lesson observations by subject and effectiveness criteria and the average achievement score in each sub-sample. A small number of observations were made in schools where Sindi was the medium of instruction; the achievement scores reflected in the table are for Urdu, which the children study as a second language. Findings are not reported for the Sindi medium teachers because their numbers are too small to draw meaningful conclusions.

Table 1: Sample and Achievement Scores

CATEGORY	SAMPLES							
	URDU		MATH		SCIENCE		URDU/SINDI	
	EFF.	LE	EFF.	LE	EFF.	LE	EFF.	LE
No. of cases	48	48	48	58	24	27	4	7
Achievement scores (mean %)	52	25	30	14	40	22	28*	13*

*Note: The score represented here is for Urdu achievement; in the schools where these classes are located the medium of instruction is Sindi and Urdu is taught as a separate language.

In most cases, the mean percent in the achievement tests of the more effective samples was double or more that of the less effective samples. Since there were few major differences in resource levels or background characteristics of students in both samples, it must be assumed that the scores serve as a measure of teacher performance. Overall the scores were low in most

classes, however, and to speak of "effective" teachers is only possible when implying a comparative position. It should be assumed when the term "effective" is used, that the implicit meaning is "in comparison with a less effective group."

An important difference between the two samples which emerged from the classroom observations is in the incidence of single and multi-grade classes. Effective performance in all subjects was much more likely to occur in single grade classrooms. Table 2 shows this phenomenon. All other conditions being similar, each grade and each individual child in multi-grade classes receives less instructional time than in classes where a teacher can concentrate on a single grade level. In a richer schooling environment, supplementary instructional materials, designed for such a situation, might compensate for the lack of teacher attention. In Pakistan, however, textbooks carry little explanation on how to solve a mathematical problem or how to understand the meaning of terms, and therefore instruction becomes highly dependent on teachers to interpret texts. When the teacher is unable to devote as much time to whole group, or individual instruction, then it is likely that the learning suffers.

Table 2: The Incidence of Single and Multi-grade Classes

CATEGORY	SAMPLES							
	URDU		MATH		SCIENCE		URDU/SINDI	
	EFF.	LE	EFF.	LE	EFF.	LE	EFF.	LE
Single grade classes(mean%)*	80	67	78	61	81	67	50	17

* Based on 260 valid observations.

Findings below about instructional practices are aggregated under the following general headings³:

- o review
- o preliminary statements
- o presentation
- o guided practice
- o independent practice
- o homework
- o teacher/student interaction

Overall, the more effective teachers consistently exhibited a greater tendency than the less effective teachers to employ the six instructional strategies listed above.⁴ The more effective teachers, however, did not necessarily spend more time on these individual practices (see below on instructional time), since overall they tended to use a greater variety of practices.

1. Review

Two kinds of activity may precede the main activities of the lesson: review of previous content material, and preliminaries which focus the attention of students on what is to come. Researchers were asked to look for both during the lesson.

In general it was consistently more likely in all subjects for the more effective teachers to engage in some kind of review. Of those teachers using review in both samples, the majority reviewed the previous day's lesson. In Urdu for example the teacher often would ask the students, one after another, to recite from memory the passages they studied on the previous day, or read again from those same passages before turning to the new material. A number of teachers returned to previous work during the observations, possibly in some cases to impress the observers with how well children could do some earlier well-learned lesson. If a teacher carried out this kind of full period review, researchers noted it on the protocols and then proceeded with the rest of the observation to describe, if appropriate, the review activities as though they were standard lessons, starting with preliminaries, continuing to presentation, guided practice, etc. Few teachers spent time at the beginning of the lesson specifically reviewing homework assignments.

If the differences between the more effective and less effective samples can be considered significant, review appears to be more important in math and science. This may be the case because new material in these subjects is more tightly bound to previously acquired concepts. In both, a review of the previous lesson is roughly equivalent in most cases to studying the prerequisites for the lesson to come. Urdu, on the other hand, is an incremental process that builds up over time and any body of content is not so likely to depend on a limited set of concepts. The nature of the achievement tests which require general abilities in Urdu and specific content knowledge in science probably contributes to this effect.

Table 3: Use of Review in Instruction

CATEGORY	SAMPLES					
	URDU		MATH		SCIENCE	
	EFF.	LE	EFF.	LE	EFF.	LE
	%	%	%	%	%	%
Use of review*	46	42	57	29	79	48
Length of review**						
short review bef.						
lesson	62	50	60	39	59	55
old material dur.						
entire less.	33	44	36	61	24	36
other	5	6	4	0	18	9

Kind of review

Homework	9	16	22	11	12	8
Prev.Lesson	50	84	70	68	67	42
Prev.Work	42	21	33	37	28	50

*Entire sample

**Portion of the sample using review

Note:Columns may add up to more than 100 because of multiple answers.

2. Preliminaries.

Preliminaries, or in more sophisticated form, "advance organizers," can help focus students' attention on what will be learned during the lesson. Preliminaries can vary from simple indications of a location in the text where a lesson can be found to a set of specific objectives which the lesson is intended to accomplish.

The researchers observed whether teachers preceded their presentation of the lesson with any kind of preliminary statements. The large majority in both samples did. Table 4 summarizes the observations concerning preliminaries.

The two samples were exactly the same in the extent to which they started Urdu and math lessons with some kind of preliminaries, but in science the more effective teachers were more likely to use preliminaries than the less effective teachers. If it is assumed that a preliminary which simply asks the children to turn to a certain page or lesson in the book has little value in terms of learning, then those preliminaries used most frequently in science by the less effective teachers have little learning value. The second type of preliminary which simply states the topic or title of the lesson also may have only marginal value in learning. The preferred option where "a teacher tells children in a few sentences what they will learn in a lesson" distinguishes between samples only in science. There, effective teachers are much more likely to use this approach. This fact suggests that in science the statement of an objective may be helpful in focusing the attention of children on the major concepts to be learned.

Overall the nature of the subject matter probably determines whether stating objectives is helpful. A subject which requires conceptual clarity may be more effectively taught when there is some way of organizing its contents around a few well-stated objectives. Otherwise, preliminaries such as "turn to the text" or "the topic of a lesson" seem simply a means of moving the activity of instruction along.

Table 4: Use of Preliminaries in Instruction

CATEGORY	SAMPLES					
	URDU		MATH		SCIENCE	
	EFF.	LE	EFF.	LE	EFF.	LE

Use of prelimin.*	%	%	%	%	%	%
	88	88	77	77	92	78
Kind of prelim.**						
Turn to text	86	91	69	64	71	95
Topic of less.	84	75	68	67	83	91
Objectives	37	39	39	38	83	19

*Entire sample **Portion of the sample using preliminaries.
 Note:Columns add up to more than 100 because of multiple answers.

3. Presentation.

The large majority of teachers in both samples introduce materials to the class in what can be recognized as a formal presentation. The difference in frequency between the two samples suggests that some kind of formal presentation is an important characteristic of effective teaching. In all subjects, more effective teachers showed consistently higher and noteworthy rates of presentation over the less effective teachers.

Presentation can be of several kinds. Teachers may present the material in small steps, giving children practice after each step; they may present the material as a whole in continuous lecture fashion; or they may begin directly with practice of the materials, interspersing the practice with periods of explanation as seems necessary. The presentation may contain definitions of concepts, and specific examples of the subject matter. Teachers may use the blackboard to present these materials or use prepared visual aids such as charts or maps.

Table 5: Presentation of Subject Matter in Instruction

CATEGORY	SAMPLES					
	URDU		MATH		SCIENCE	
	Eff	LE	Eff	LE	Eff	LE
	%	%	%	%	%	%
Use of present.*	83	66	77	67	96	82
Kind of present.**						
Small steps	23	39	41	42	29	18
Lecture	58	46	30	63	67	59
Direct prac.	35	33	35	24	21	55
Definitions	50	49	46	32	79	46
Examples	38	33	62	46	75	27
Blackboard	45	30	70	59	50	23
Visual:charts	5	3	5	0	8	14

*Entire sample **Portion of the sample using presentation
 Note:Samples add up to more than 100 because of multiple answers.

In Urdu, the lecture method or explaining the material as a whole

appears to be the most successful method of presentation. In such a case, a teacher may read the entire passage to the students with comments on the content and perhaps definitions of terms, before the students attempt the lesson themselves. The success of this method in Urdu may be due to the fact that children have time to concentrate on comprehending the content of the material before being thrust into the mechanics of deciphering it. Teachers who use this approach appear to have a genuine concern for seeing that children understand a lesson. Adding one more step before complete immersion in recitation, gives another way to become familiar with material, increasing the variety of approaches that may be useful to different kinds of learners. A step by step process, otherwise often a good pedagogical device, may disturb comprehension of the full meaning of the story or passage. Teachers who use this approach are likely to explain a few paragraphs of the lesson, have the children repeat it several times, explain a few more paragraphs, have the children repeat the material, etc.

In math, presentation as a whole or lecture method is considerably less effective than methods of presentation which emphasize definitions of concepts, specific examples, the use of blackboards to display examples and direct practice without other presentation. Constructed responses when a child is asked to actually do something with material--usually writing out the problem in this case--helps in remembering the kind of material required for math.

In science, more effective practices include presenting materials in small steps with some kind of practice after each step, providing definitions of concepts, concrete examples of the subject matter, and using the blackboard for visual representations of the scientific concepts. In science, conceptual learning seems to be helped by a presentation of both negative and positive examples of the concepts. Asking children to go directly to reading their science books or otherwise practicing without prior explanation appears to be a less effective option.

Table 6 shows the importance of clarity in the presentation of materials. In almost every instance, effective teachers are more likely to give clear explanations and instructions, use words of the proper level of difficulty for the children, and use a language for explanations that the children understand.

Table 6: Clarity in Presentation

CATEGORY	SAMPLES					
	URDU		MATH		SCIENCE	
	EFF.	LE	EFF.	LE	EFF.	LE
	%	%	%	%	%	%
Most explanations are confused	35	42	14	32	25	50

Most explan. and instr. clear	78	55	92	66	79	36
Words are correct lev. of difficulty	63	39	60	51	63	27
Lang. understood by children	88	91	95	83	92	82

Note: Columns add up to more than 100 because of multiple answers.

Table 7 reports the assessments of observers about pacing in the presentation of material. The pacing was consistently more likely to seem appropriate in all subjects for the more effective teachers. In Urdu and math, the pacing seemed too slow in the less effective sample and in science too fast.

Teachers are required to keep to a timetable in covering the texts. The timetable, however, is general and requires only that certain units or chapters be completed within a certain time frame. Because this is one item supervisors are likely to check when they visit schools, teachers feel compelled to move at a pace that will keep them in line with the schedule. Students can often report to the fraction of a page how much of the text the teacher will cover in a lesson. Though differences are not major between the samples, even a fraction of a page can be important over the school year. Effective teachers tend to cover more pages in math and science and slightly fewer in Urdu than the less effective teachers. Since the pacing of more effective teachers' lessons is more likely to be "about right" one might assume that the pace with which the text is covered is also about right. Logic suggests that each class probably has its own appropriate pace, and if more effective teachers are better able to judge that pace in their students, then generally speaking either the students of the less effective teachers are slower or the teachers are not evaluating their capabilities as well. In Urdu and math, observers thought the less effective teachers were pacing their lessons too slowly and in science too quickly. While pedagogically it is probably better to pace the lesson to the speed of the individual class, it is interesting that better performance in this sample is not necessarily dependent on moving more slowly through the textbook.

Table 7: Pacing in Presentation as Judged by Observers

CATEGORY	SAMPLES					
	URDU		MATH		SCIENCE	
	EFF. %	LE %	EFF. %	LE %	EFF. %	LE %
Pacing seems:						
about right	65	49	73	44	67	46
too slow	15	27	14	37	21	18
too fast	10	18	5	10	13	27

other	10	6	8	10	0	9
Number of pages covered in a lesson	2.0	2.1	1.5	1.2	2.6	2.1

From observing student reactions to the teachers' presentations, the observers were asked to judge pacing in relation to the level of student ability. Table 8 summarizes their assessments.

In all subjects, effective teachers tended more often to pace the lesson to the slower students, whereas the less effective teachers were consistently more likely to pace the lesson to the smartest children. The more effective teachers, therefore, were more conscientious about seeing that all the children learned the new materials while the less effective teachers took the easier course of teaching to those who grasped the content easily.

Table 8: Pacing in Relation to Student Ability in Presentation

CATEGORY	SAMPLES					
	URDU		MATH		SCIENCE	
	EFF. %	LE %	EFF. %	LE %	EFF. %	LE %
Pacing level*						
for slowest	56	46	58	50	54	30
for smartest	10	26	29	31	27	55
for middle	32	26	13	19	18	15
Not possible to know	23	9	16	12	8	9

*For classes where it was possible to assess children

Table 9 reports the appropriateness of the presentation as far as understanding is concerned. The majority of teachers in all samples presents materials at a level that the observers feel is appropriate for understanding, but effective teachers are consistently more likely to present materials in this manner. This is true for the level of the subject matter, of the textbook content, and of the clarity of the teachers' explanations.

The subject level in Urdu is sometimes too difficult in the less effective sample, and the textbooks were considered too easy in math and science for this group. It is difficult to understand why the textbooks would be too easy unless perhaps these observations were taken from classes where teachers were turning back to previously learned lessons. Above it was noted that the less effective teachers were more likely to return to earlier pages in the text, particularly in math and science. An alternate explanation might be that since the less effective

teachers pace the presentation more to the smartest students, it may have given the observers the impression that the textbooks were too easy.

Table 9: Appropriateness of Presentation for Understanding

CATEGORY	URDU		MATH		SCIENCE	
	Eff %	LE %	Eff %	LE %	Eff %	LE %
Present. apppr.	76	67	100	76	92	59
Subject level						
about right	90	79	87	73	88	82
too easy	10	6	11	18	8	14
too diff.	0	15	3	10	4	5
Textbook level						
about right	90	82	89	73	83	77
too easy	8	9	3	20	8	18
too difficult	3	9	5	8	8	5
no text used	0	0	3	0	0	0
Teacher explanation						
clear	75	42	70	59	88	23
sometimes dif.	15	27	24	32	4	32
often dif.	10	30	5	10	8	46

4. Guided Practice.

Guided practice was defined for the researchers/observers as the initial teacher-supervised efforts of the students to practice new materials. Guided practice usually involves a fairly rapid interaction between teachers and students as tasks are assigned, students accomplish them in some way that is relatively visible for the teacher, the teacher reacts, and the student begins practice with another similar task. Ideally in guided practice there should be active practice by the child and some sort of feedback on how well the child is doing. In some classes that were observed, however, teachers "practiced" in front of the

children, or feedback was directed in a general way to the whole class with little opportunity for children to know directly from the teacher how they were doing individually.

Guided practice and independent practice (reported below) are difficult to distinguish in some classes. Some teachers conduct them as if they are different degrees of what is essentially the same activity, the only difference being the closer supervision and the more active group involvement of the students in guided practice. Some teachers, of course, use what can be distinguished as one practice and not the other.

There are various ways that guided practice was conducted in the classrooms of the sample. Some teachers give one task after another without providing much guidance or feedback individually to students. In this case the teacher does not know how well the student is doing. A teacher may give a series of tasks and then provide feedback at the end when all the tasks are completed. The teacher can give one task at a time and provide feedback following the completion of each task. Or the teacher can demonstrate or explain and expect children to follow along in the task, without giving them an opportunity individually to know how well they are doing.

Table 10 shows the incidence of guided practice in the sample. The majority of teachers in almost every sample use what observers felt was guided practice. In all subjects, effective teachers are consistently more likely to use guided practice than the less effective teachers.

Table 10: Use of Guided Practice in Instruction

CATEGORY	SAMPLES					
	URDU		MATH		SCIENCE	
	EFF. %	LE %	EFF. %	LE %	EFF. %	LE %
Use of guided prac.*81		70	96	79	75	48
Kind of pract.**						
Prac.w.no explan.	42	34	42	44	6	54
Child finish sev. tasks bef.fdb	11	19	16	13	22	8
Fdbk.after ea.task	37	38	31	33	61	39
Expl. and no fdbk.	3	3	6	11	6	0
Other	8	1	5	0	6	0

*Entire sample **Portion of the sample using guided practice

In Urdu it is not clear what kind of guided practice produces the best results. The largest proportion of those teachers who use guided practice, simply assigns tasks and lets the children work on them without further explanation--an example of this practice is when teachers call on children in turn to recite or read from

the book. This kind of practice seems generally more effective in Urdu than science where it appears to be better either to give feedback after each task or after several tasks have been completed. Urdu may simply require a great deal of practice in reading and writing to develop skill while learning the concepts of science needs the greater involvement of the teacher.

Table 11 shows the systems teachers use for calling on students and the amount of coverage that occurs by the end of the subject period.

In the majority of cases in all samples, more than half of the students are given an opportunity to practice the new materials during guided practice. In addition, effective teaching is characterized by even greater coverage of the students in Urdu and math classes.

Table 11: Coverage in Guided Practice

CATEGORY	SAMPLES					
	URDU		MATH		SCIENCE	
	EFF. %	LE %	EFF. %	LE %	EFF. %	LE %
System for calling on students						
brightest						
slowest						
volunteers						
random						
order						
mix						
Coverage of guided prac.						
Every ch.prac.	71	56	71	61	29	46
More than half ch.prac.	13	31	25	35	59	15
Less than half ch.prac.	13	9	2	4	12	39
Other	3	3	2	0	0	0

Table 12 shows the sources and kinds of tasks used in guided practice. The vast majority of teachers in both samples use some kind of assigned task in guided practice, and most use some or all tasks which are based on materials from the textbooks.

The kinds of tasks used by teachers are mainly constructed tasks where the children performs an operation such as copying, writing, repeating, memorizing, giving examples, etc. Only one, watching demonstrations, is passive, and probably only one, showing understanding, requires higher order thinking skills.

In Urdu instruction, the main strategies teachers in both samples

use are tasks which require explanations and meanings, individual repetition, reading, writing and copying. Effective teachers are more likely to require students to show understanding of a problem or task, to learn basic facts about a subject, and to practice writing than are less effective teachers. Less effective teachers are more likely to use individual repetition and correction of practice exercises as the basis of tasks.

In math the major teacher strategies include explanations, repetition, showing understanding, learning basic facts, writing, correcting examples, copying problems from the board or text and watching demonstrations. In math as in Urdu effective teachers are more likely to ask children to show understanding and to learn basic facts. Less effective teachers surprisingly require more explanation of the material in math than effective teachers.

Table 12: Use of Tasks in Guided Practice

CATEGORY	SAMPLES					
	URDU		MATH		SCIENCE	
	EFF. %	LE %	EFF. %	LE %	EFF. %	LE %
Use of tasks	90	88	96	96	89	92
Source of tasks						
teach. created	18	16	16	11	11	8
textbook	90	94	91	94	94	92
Kind of tasks						
explan.	44	50	42	57	67	46
examples	24	28	27	28	39	46
summaries	16	9	0	2	33	15
choral repet.	29	34	27	24	28	77
indiv. repet.	55	67	33	37	50	54
reading	68	75	16	15	44	69
understanding	66	41	42	24	72	31
meanings	47	44	16	9	33	23
learn names	16	9	4	2	0	0
basic facts	26	9	53	33	72	39
identify items	29	25	27	26	28	23
writing	58	41	47	39	39	15
correct	13	34	42	44	44	15
copy	42	34	38	30	22	39
watch demon.	24	25	44	38	61	23
How tasks imple.						
Teach.directs/stu. responds	74	59	73	76	59	69
Student questions	13	3	9	9	29	15
Both	13	34	16	15	12	15
Other	0	3	2	0	0	0

Note: Percentages may add up to more than 100 because of multiple

answers.

In science, the tasks teachers construct involve explanation, recitation (both choral and individual), examples, reading, understanding and meaning of concepts, basic facts and watching demonstrations. More effective teachers of science require more explanations, showing understanding, giving meanings, practicing writing, correcting practices and watching demonstrations than less effective teachers. Less effective teachers are more likely to require children to copy materials, to repeat materials chorally, and to read materials out loud or to themselves--all tasks which do not require active engagement of the intellect or, in the case of science, an understanding of the important concepts.

Most teachers control the activities of guided practice closely by assigning a series of tasks or problems to students and expecting the students to respond only when specifically replying to questions. In some classes, however, teacher feedback and explanation is initiated by student requests for information. In Urdu, effective teachers are more likely to use a directive approach while, in science, students are given more freedom to initiate interactions.

Table 13 shows the number of tasks assigned during guided practice.

Table 13: Number of Tasks in Guided Practice

CATEGORY	URDU		MATH		SCIENCE	
	Eff %	LE %	Eff %	LE %	Eff %	LE %
Number of tasks						
1-3	47	81	36	42	88	69
4-6	32	15	42	39	12	23
7-9	11	3	13	7	0	0
10-12	5	0	7	13	0	0
13 or more	3	0	2	0	0	8
other	3	0	0	0	0	0

In guided practice usually 6 or fewer tasks are assigned. In Urdu while the majority of teachers in both samples assign one to three tasks, effective teachers are more likely than less effective teachers to assign more than three tasks. In math, beyond a general tendency in both samples to assign more tasks generally, there is no clear difference between the samples in the actual number assigned. In science, effective teachers are more likely to assign one to three tasks while less effective teachers may assign more. The greater number of tasks assigned by less effective teachers in science may reduce the amount of time that can be given to presentation and discussion of

concepts, which as noted elsewhere appears to be an important part of effective science teaching.

Table 14 shows the kinds of responses expected in guided practice.

Some of these questions were designed to see which of Bloom's levels of learning were expected from children in guided practice. The most common responses expected in Urdu are specific single correct answers, recitation and copying, all generally low order skills. In math they are specific answers, description of the process by which a result is obtained, application, repetition and copying, again mainly low level skills. In science, teachers also expect specific answers, memorized responses, repetition and copying. The effective teachers consistently asked more often for specific answers which, given the nature of the kinds of tests children take, helps prepare them with the kinds of answers that are required to do well.

Table 14: Responses Expected in Guided Practice

CATEGORY	SAMPLES					
	URDU		MATH		SCIENCE	
	EFF. %	LE %	EFF. %	LE %	EFF. %	LE %
Type of response						
specific ans.	55	41	80	70	72	69
process ans.	26	19	40	44	28	31
evaluation	5	13	9	9	28	8
applica. ans.	5	13	38	26	6	8
synthesis	18	3	2	7	11	0
analysis ans.	11	10	11	4	17	8
memorized ans.	24	22	13	2	44	39
recitation	42	56	11	13	11	46
repetition	29	56	27	28	56	62
copying	40	31	33	20	17	46

Note: Percentages add up to more than 100 because of multiple answers.

Some responses distinguish by their differing magnitudes between the two types of sample. Effective teachers of Urdu are more likely than the less effective teachers to require specific answers and to ask children to synthesize ideas that they have learned separately. They are less likely than the less effective teachers to use recitation and repetition as a major means of practice. Thus, as seen previously, effective teachers work somewhat more at engaging the children's intellect, rather than simply requiring rote, mechanical exercises.

Effective teachers of math are more likely to require specific answers, application of a principle to a new problem, and memorized examples (such as multiplication tables).

Effective teachers of science are more likely to require evaluation answers where a child is asked to assess the merits of some phenomenon, while less effective teachers rely more heavily again on recitation and copying.

Table 15 shows how students are involved in guided practice. Teachers of both samples usually involve students individually by requiring oral responses, or giving them practices which they engage in at their seats. They also may ask children to respond orally as a group.

More effective teachers of Urdu tend to use more seat practice, as well as more involvement of the children in leading class response or in instructing the class as a whole. In such cases the child comes to the front of the room and recites a part of the lesson which the rest of the class repeats or comments on, or demonstrates a part of the lesson to reinforce learning of a concept. Less effective teachers are more likely to ask other students to help their peers at their seats. In these cases, the teacher may use this device as a convenience which allows them to avoid taking the time for individual help rather than as a means of solidifying learning in the student helper. The helper student may simply give the right answer to the student he or she helps.

Effective teachers of math use more seat work practice, and are more inclined to ask children to comment on the correctness of other children's work in front of the class. They are also more likely to ask children to work at the blackboard, and to ask for individual oral response to questions. Most of these exercises allow for individual practice and feedback. Less effective teachers are more likely to ask children to lead the class in oral responses. Again, as is the case with peer help, some teachers may abdicate their responsibilities by relying on student monitors to carry on with recitations. In the worst examples of these choral exercises, student monitors may also chant incorrect phrases and the class automatically repeats the incorrect phrase even though they may actually know the correct response. Unless carried out with careful teacher monitoring, the choruses become the worst kind of mindless mechanical behavior, detracting from, if incorrect content is repeated, rather than supporting learning.

Table 15: Student Involvement in Guided Practice

CATEGORY	URDU		MATH		SCIENCE	
	Eff %	LE %	Eff %	LE %	Eff %	LE %
Type of involve.						
blackbd.work	11	3	13	15	24	0
oral chor.resp.	16	25	24	24	47	54
oral ind.resp.	74	69	47	54	77	62

seat practice	66	44	93	83	53	54
comment on oth.	13	13	13	2	24	0
peer help	11	22	11	17	0	8
lead cl.resp.	18	6	18	15	0	15
instruct class	13	3	11	7	12	7

Note: Percentages add up to more than 100 because of multiple answers.

Table 16 summarizes the observers assessments of student understanding of subject matter at the end of guided practice. In the majority of classes there was some sign that children understood the material at the end of guided practice. The observers noted seeing students answering correctly more often in the classes of effective teachers, and there was a consistently stronger tendency for more effective teachers to ask children directly if they understood the material. In science, particularly, there were much greater evidence in the more effective classes that students understand the lesson. Other signs include watching for how many children raise their hands and whether children work the tasks with little hesitation. Though these results do not indicate, except when teachers ask, whether teachers are using visual signs of assessment, the findings suggest that it is at least possible for teachers to use such observational techniques to ensure the understanding of students.

Table 16: Student Understanding in Guided Practice

CATEGORY	SAMPLES					
	URDU		MATH		SCIENCE	
	EFF. %	LE %	EFF. %	LE %	EFF. %	LE %
Signs of underst.						
most ans.cor.	58	42	51	35	56	39
many raise						
hands	50	56	40	39	72	31
teach.asks	76	72	76	73	83	54
work wo.hesi-						
tating	63	69	80	71	67	77
No way to know	8	12	7	6	11	15

Note: Percentages add up to more than 100 because of multiple answers.

Table 17 describes teacher feedback to correct and incorrect answers of students. Effective teachers are consistently more likely than less effective teachers to give some kind of response to a correct answer. They are also consistently more likely to elaborate their approval by repeating the correct answer or reteaching the point with a statement that says, "Yes, that is correct because of (the following reasons)." Feedback for these

teachers becomes an opportunity to reiterate the principles of the lesson.

In the case of incorrect answers, the most noteworthy and consistent difference across subject matters is the stronger incidence in effective teachers of feedback for the teacher to explain how to do the problem and ask the child to try again. Otherwise, more effective behaviors differ by subject matter. In Urdu, effective teachers are more likely to state correct answers and move on. In math, the more effective teacher is likely to give the child a hint and try to elicit a correct response. In science, the more effective feedback is one where the teacher simplifies the question and asks again. In most of these cases, the more effective feedback consists of helping the child come to a correct answer rather than allowing the child to fail or give up trying to find the correct answer.

Table 17: Teacher Feedback to Correct and Incorrect Answers

CATEGORY	SAMPLES					
	URDU		MATH		SCIENCE	
	EFF. %	LE %	EFF. %	LE %	EFF. %	LE %
Feedbk:correct ans.						
no response	21	41	24	30	17	23
brief praise	40	47	60	52	67	54
repeats correct answer	68	63	60	52	83	46
yes because..	58	34	47	44	67	46
Feedbk:incorr.ans.						
tch.simplifies question	53	59	64	50	83	47
tch.hints	34	47	60	48	61	54
tch.gives corr.	82	63	60	67	56	54
tch.goes to others	11	22	18	17	0	21
tch.explains/ ch.redoes	42	28	76	61	50	31

Note:Percentages add up to more than 100 because of multiple answers.

5.Independent Practice.

Independent practice was defined for the researchers as that part of instruction when students work on their own at their seats with less supervision from the teacher than occurred during guided practice. As noted earlier, independent and guided

practice appear in some cases as gradations of each other. The purpose of independent practice is for the child to gain confidence in the skill by him or herself, after first efforts have been carefully monitored by the teacher during guided practice to ensure that the skill is being learned correctly. When teachers distinguish these two types of learning in the sample, their response is probably an intuitive feeling that children need both kinds of practice, since they are not explicitly taught to distinguish these activities in teacher training.

The majority of each sample of teachers included what the observers could distinguish as a period of independent practice in the lesson period. More effective teachers, however, consistently used independent practice more than the less effective teachers.

Table 18 shows the incidence and kind of independent practice. The most frequent kind of independent practice in all subjects was individual seat work carried out by the student alone.

Table 18: Use and Kind of Independent Practice

CATEGORY	SAMPLE						
	URDU		MATH		SCIENCE		
	EFF. %	LE %	EFF. %	LE %	EFF. %	LE %	
Use of ind.practice*		89	55	73	54	70	65
Kind of ind.practice**							
seat work	93	89	86	93	87	100	
grade level							
groups	10	15	17	17	7	6	
small group	0	15	11	3	7	0	

*Entire sample **Portion of the sample using independent practice. Note: Percentages may add up to more than 100 because of multiple answers.

Table 19 shows the sources and characteristics of tasks in independent practice. The large majority of all samples in all subject matters use textbooks as the source of tasks. This is also consistently more true for effective teachers. Although the practice is infrequent, less effective teachers are consistently more likely to create their own tasks, suggesting that teacher created tasks may not be as effective as textbook ones, either because they do not cover the content as well or because they do not give as much practice in the kinds of questions which are asked on the tests.

It is also fairly common in all subject matters to copy or rework problems from guided practice. In science, particularly, effective teachers are more likely than less effective teachers to ask children to copy or rework problems learned in guided practice.

The kinds of tasks in independent practice tend to vary importantly by subject matter. In Urdu, teachers are likely to ask children to copy from textbooks or blackboards, and to assign children reading and writing practice tasks. In math, teachers are likely to ask children to solve problems or to copy from texts, or practice writing problems over again in approved form. In science children copy, read, and memorize.

While there is only one type of task in Urdu which more effective teachers are more likely to use than less effective teachers (copying the meanings of terms), there are several practices which less effective teachers are more likely to use: copying from guided practice, reciting alone at seat, and memorizing text material. Using such rote practices exclusively may therefore prove less productive of learning in Urdu.

In math, similarly, only one difference is noteworthy: less effective teachers are more likely to ask students to explain the new material. It is unclear why this behavior is more common in the less effective group. In science, copying material from the blackboard and writing labels to illustrate scientific principles are more commonly employed effective practices while simply writing something more neatly as a writing exercise, is the more common practice among less effective teachers, and therefore appears ineffective as a learning experience in that subject.

Table 19: Tasks in Independent Practice

CATEGORY	URDU		MATH		SCIENCE	
	Eff %	LE %	Eff %	LE %	Eff %	LE %
Source of tasks						
teach. created	10	19	14	24	0	8
textbook	92	77	89	73	93	88
copied from						
guided prac.	31	27	33	37	33	6
reworked from						
guided prac.	33	35	39	23	13	0
Kind of tasks						
explanations	23	15	25	40	27	29
examples	15	12	22	23	20	13
copying from						
text or blkbd	45	50	44	50	47	35
copying from						
guided prac.	33	46	33	30	20	29
writing prac.	53	50	35	43	20	47

recite at seat	10	23	19	13	33	35
solve prob.	13	19	56	57	20	18
reading	40	46	11	7	40	53
memorizing	10	46	19	10	40	53
meanings	22	12	6	3	13	6
labels of items	3	12	0	0	29	0

Note: Percentages add up to more than 100 because of multiple answers.

Table 20 shows the kind of teacher monitoring and feedback that is carried out during independent practice. A variety of monitoring practices are used by both groups: children who complete the work come to the teacher at his or her desk for correction; the teacher walks around the room stopping to check individual work or; children raise their hands to indicate that they have finished the task or need help. Some teachers assign tasks and then ignore the students. This last passive practice is consistently used more frequently by less effective teachers in each subject.

In Urdu, no practice among the three active monitoring strategies stands out as more characteristic of the effective sample. Of the three, the child coming to the teacher and the teacher walking around the class are generally more utilized. In math, the practice of more effective teachers which contrasts most clearly with the less effective group is the one where children indicate their need for help. In science, the more effective teachers either walk around the room or the children come to the teachers to show their work. These findings suggest that it is not so much the specific type of monitoring that goes on, as it is the fact of whether that monitoring allows productive interaction between children and teacher. Leaving children on their own without feedback or any kind of supervision is not an effective practice.

Table 20: Monitoring and Feedback in Independent Practice

CATEGORY	SAMPLES					
	URDU		MATH		SCIENCE	
	EFF. %	LE %	EFF. %	LE %	EFF. %	LE %
Kind of monitoring						
teach. ignores	26	50	19	33	20	29
ch. come to						
teacher	54	46	58	60	67	41
teacher walks						
around	54	58	69	63	67	53
ch. indicate						
need	39	42	64	40	47	53
Kind of feedback						
to indiv. stu.	44	56	44	47	53	35

to whole gr.	49	42	61	47	33	53
to small groups	5	0	6	13	13	6

Comprehensiveness

all	
more than half	
half	(data being computed)
less than half	
none	

Note: Percentages add up to more than 100 because of multiple answers.

It is also not possible to indicate which kind of feedback is most effective. Teachers about equally direct their feedback either to individual students or the whole class. In math, there may be more benefit from addressing the whole class while in science giving children individual attention may be more effective as a teaching strategy. The importance of various strategies may lie in the circumstances existing in the classroom. Many classes are so large as to preclude much individual attention, and if much time is spent on this kind of attention in these classes, it may reduce the amount of instructional time that is available for each student. The teacher needs, therefore, to make intelligent decisions about what is the best kind of feedback to benefit the greatest number of students in his or her class.

Of all the major activities in the classroom, independent practice is the one which gives the teacher the most opportunity to devote special attention to individual students who need help. While other students work on their tasks, the teacher can circulate around the room and quickly give brief periods of instruction to those who are having difficulty. In classes where all children are grasping the material well, it may be sufficient for them to monitor their own work from teacher feedback directed to the whole class.

6. Homework.

In the instructional periods covered by the study, only a third or fewer of the teachers were observed actually assigning homework. It is possible that children automatically assume a homework assignment and do it without being asked. Table 21, summarizes the findings about homework. In Urdu, both samples were about as likely to assign homework, but in math and science, effective teachers were more likely than less effective teachers to assign such work.

Table 21: Homework

CATEGORY	URDU	SAMPLES	
		MATH	SCIENCE

	EFF. %	LE %	EFF. %	LE %	EFF. %	LE %
Use of homework*	29	33	35	19	33	19
Kind of homework**						
explana./ans.	33	19	0	17	63	20
examples	20	38	13	25	25	20
summarize	13	13	13	17	13	0
solve problems	6	31	80	68	38	40
rewrite	53	56	47	17	25	60
memorize prose	20	25	0	8	38	20
memorize facts	7	13	13	8	25	0
original work	20	25	0	8	0	0
calligraphy	53	19	13	8	0	0
drawing	27	6	0	8	0	0

*Entire sample **Portion of the sample using homework.
Note: Percentages add up to more than 100 because of multiple answers.

The kind of homework assigned differed considerably by subject matter. In Urdu, teachers in both samples were most likely to ask children to rewrite work carried out in class. Effective teachers were more likely to assign homework that required explanation or answering questions, calligraphy or drawing. Less effective teachers were more likely to ask for examples of the material, and to ask children to solve problems posed in the text or by the teacher.

In math, in both samples, the most common practice is for homework to consist of solving problems. Effective teachers employ the strategy of asking children to solve problems and rewrite examples from the lesson more often, while less effective teachers are more likely to call for simple explanation/answers and examples of the work.

In science effective teachers are more likely to ask children to write explanations/answers, and to memorize facts or prose. Less effective teachers are more likely to ask children to rewrite materials they learned in class.

Table 22 indicates how the homework is corrected. In a number of the classrooms, the observers were aware that there was homework but did not observe how it was corrected. In all subject categories, therefore, data are missing. If the missing cases are excluded, the overwhelming majority of remaining teachers employ the practice of correcting children's books individually.

Of the classrooms where it was observed that there was homework, a large proportion of teachers required that children correct their mistakes in homework. It can probably be assumed that

teachers in such classrooms, by simply involving the students in some sort of activity regarding homework, pay more attention to this activity and are therefore more likely to require correction of mistakes.

Table 22: Correction of Homework

CATEGORY	SAMPLES					
	URDU		MATH		SCIENCE	
	EFF. %	LE %	EFF. %	LE %	EFF. %	LE %
Kind of correction						
teach.in books	73	100	67	75	40	100
tch.in sm.grs.	0	0	0	0	0	0
tch.w.full cl.	0	25	11	13	0	0
other adult	0	0	0	0	0	0
ch.do ea.other	0	0	0	0	0	0
other	0	13	0	13	0	0
hmwk but didn't see corr.	27	11	22	38	60	0
Child corrects mistakes	77	56	80	86	60	100

Note: Percentages add up to more than 100 because of multiple answers.

7. Teacher-student interactions.

Table 23 describes the character of teacher-student interactions.

The majority of teachers in both samples direct most of the activities in the class and students respond only when called upon.

In addition, more of the effective sample permit students themselves in all subjects to initiate exchanges in the classroom. This kind of freer exchange seems to be particularly characteristic of effective teaching in science, confirming the findings above under "guided practice," about the extent to which teachers allow greater freedom for students to initiate some of the learning interactions in this subject.

Table 23: Teacher-Student Interactions.

CATEGORY	SAMPLES					
	URDU		MATH		SCIENCE	
	EFF. %	LE %	EFF. %	LE %	EFF. %	LE %
Character of inter.						
permissive						
firm						
brusque						
harsh						

Kind of interaction						
stu.direct some						
of inter.	15	15	13	13	21	7
free exchange	23	10	21	7	46	15
teacher directs						
w.stu.res.	81	77	90	95	67	67
teacher lectures						
w.little						
stu.invol.	19	27	25	20	42	44

Note: Percentages add up to more than 100 because of multiple

Table 24 shows the way behavior is controlled in the classroom. Overall, children appeared well-behaved in the classrooms. In most cases they have been trained to sit quietly and not to disturb others in the class. Physical punishment is often used for very minor infractions of the rules of the classroom: not sitting in orderly rows, speaking to a neighbor, or not paying attention. Almost as often a child is punished for mistakes in school work such as a misspelled word in dictation, or misreading a passage in Urdu. Many teachers display a stick conspicuously in the classroom where it serves as a reminder of what might happen if the child misbehaves or answers incorrectly. If there are any regulations about physical punishment, they are not in evidence in the classroom. Enough teachers used these measures in front of the researchers to make it appear that they considered it their duty rather than an exception to carry out such punishments. In one case when a teacher came late, he immediately started beating children as if to show researchers that, in fact, he was not negligent in his duties.

Table 24 reports on behavior control in the classroom. There were various degrees and types of control observed. In some classes teachers established a set of conduct rules which are well-known to the children, and except in unusual circumstances are usually observed without outward need for control from the teacher. This type of control places a share of the responsibility on the child. Other teachers depend less on encompassing rules and more on immediate intervention in each case where behavior may get out of line. Children in these classes learn over time what kinds of behavior are acceptable or unacceptable to a teacher when he or she is watching. The responsibility for discipline in this kind of control lies mainly with the teacher and can often be distinguished from the earlier kind of control at the point when a teacher goes out of the classroom for a few minutes. Then discipline rapidly breaks down.

A few teachers allowed a great deal of disruptive behavior before they took any action, and some showed almost no control over their classes at all, even when the situation clearly called for some kind of action. In the Pakistani context where an orderly

environment is one of the valued aims of the schooling system, these two types of reaction usually reflect a teacher who is not adequate to the job or who is not motivated to do good work.

Table 24: Behavior Control in the Classroom.

CATEGORY	SAMPLES					
	URDU		MATH		SCIENCE	
	EFF. %	LE %	EFF. %	LE %	EFF. %	LE %
Kind of control						
conduct rules						
teacher immed. interven.			(data being computed)			
latit.before interven.						
no control						
Nature of control						
oral	48	63	38	50	50	56
physical	13	8	8	14	8	15
observed both	8	6	8	9	4	15
obser.neither	38	37	62	47	38	44

Note: Percentages may add up to more than 100 because of multiple answers.

Less effective teacher in all subjects consistently use more oral means of control.

Summary and Discussion

All other characteristics being equal, important differences in academic performance of children seem to result from the accumulated impacts of better instructional practices used by effective teachers. At present, these effective teachers may simply possess greater intuitive feeling for what works well in the classroom, since little concerning these specific issues is contained within current teacher training courses. This process need not remain intuitive once it becomes clear what constitute effective instructional behaviors.

In an experimental training program to improve the quality of classroom instruction, for example, a methods course might be devised for teachers incorporating the most commonly used instructional practices of effective teachers in this study (see Table 1A in Annex 1A), with an emphasis on the practices which distinguish the effective from less effective samples (see Table 1B in Annex 1B). An important finding that emerges from this study is that effective teachers tend to use a greater variety of activities in instruction with much greater systematization in

the steps of learning. These findings are implicit in the fact that more of the effective teachers engage in each of the major lesson activities than is the case for less effective teachers. This greater variety of strategies organized in a systematic set of classroom activities may provide the framework for an effective school improvement program.

At present there is a 2 percent difference between the effective and less effective samples in current year repetition and dropout rates. If the introduction of effective methods were to reduce those attrition rates in less effective schools by this same two percent amount yearly, there would be important increases in primary school completion rates. For dropouts, these figures are conservative for they do not take into account the children who do not now return after summer vacations.

It is, of course, impossible to conclude that the use of a set of specific instructional practices will in all cases and at all times lead to improved academic performance in children. The nature of the subject matter and the capacity of the teacher to use certain practices make some clearly better than others in specified contexts. Many of the practices which characterize the more effective sample are also used widely by the less effective teachers who also see their appropriateness in varying contexts.

It should also be cautioned that just because a particular practice is not used frequently by the more effective teachers, does not mean that it could not prove effective if utilized more often. For example, teachers in both samples rarely use charts or other visual materials. Often appropriate materials may not be available. If used more often to supplement the lesson materials, charts and other visual materials might contribute significantly to better learning.

Explicit teaching methods

The study was designed to compare the practices which distinguish effective teachers in the sample with explicit teaching methods used effectively elsewhere. According to Rosenshine (1986)⁵, research on explicit methods over more than a decade show them to be useful in any "well structured" discipline, where the objective is to teach performance skills or mastery of a body of knowledge.

They are especially useful in:

"the teaching of mathematical procedures and computations, reading decoding, explicit reading procedures such as distinguishing fact from opinion, science facts and concepts, social studies facts and concepts and rules, and foreign language vocabulary and grammar...(They) are less relevant for teaching in areas ...where the skills do not follow explicit steps or the concepts are fuzzier and

entangled (such as) writing term papers, reading comprehension, analyzing literature or historical trends, or for teaching entangled concepts such as "liberal" or "modernism" (Rosenshine 1986:60).

The explicit teaching method has been chosen here as a basis for comparison because its disciplined and orderly approach seems most similar to that which is used, and considered sound, in the present Pakistani instructional context. The details of this approach have been embedded among other instructional practices in the observation forms used in the study. Table 1C summarizes the extent to which these explicit teaching practices are found to be characteristic of the more effective sample. The assumption is that if the effective sample possesses enough of the characteristics of explicit teaching to demonstrate its compatibility in the Pakistani context, and if the characteristics of explicit teaching also tend to be those which distinguish between the effective and less effective samples, then there may be important implications for school improvement in Pakistan. A vast body of literature on explicit teaching already exists and could be adapted to the particular needs of Pakistan.

Besides providing a rich background literature, explicit methods may suggest a direction for further improvements that, given compatibility of approach, are more likely to succeed than approaches which are less similar to those presently in use in the Pakistani context. The term 'explicit' is important in this respect, for even when an effective teacher uses what turns out to be an effective practice, he or she may be acting out of intuition, rather than out of secure knowledge that the practice is appropriate. From the low overall achievement score, the present study suggests a need for improvements in all schools of the sample⁶. Samples were distinguished by their comparative performance, but none demonstrated outstanding performance on the achievement tests. In any comprehensive improvement program it would be important to look for practices which could also increase the performance in effective schools. Before establishing such an improvement program, it would be important to identify methods and approaches which have demonstrated capability in and compatibility with the local situation. From the similarities of the effective practices with explicit teaching methods, this may be one such approach.

The explicit teaching method emphasizes the following instructional behaviors. The teacher:

- o begins a lesson with a short statement of goals;
- o begins a lesson with a short review of previous, prerequisite learning;
- o presents new material in small steps, with student practice after each step
- o gives clear and detailed instructions and explanations

- o provides active practice for all students;
- o asks many questions, checks for student understanding, and obtains responses from all students;
- o guides students during initial practice;
- o provides systematic feedback and corrections;
- o provides explicit instruction and practice for seat work exercises and, where necessary, monitors students during seat work; and
- o continues practice until students are independent and confident. (Rosenshine 1986:60,62).

Table 1C in Annex 1C compares the distinguishing characteristics of the effective sample with these step by step procedures of explicit teaching. Overall as a sample, the practices distinguishing effective teachers are similar enough to those recommended for explicit teaching to suggest that the latter might prove a satisfactory model for effective teaching in Pakistan.

ANNEX 1A

Most Frequently Used Practices of Effective Teachers

In Table 1A, the most common instructional practices of more effective teachers are listed. The major categories (review, preliminaries, etc.) are all reported as a percent of the total effective sample, while the subsumed practices are noted as a percent of the major category. The latter are only reported when more than a half the relevant group use a practice. For example, the table may be read as follows, "Of those who use some form of review, such and such a percent review the previous lesson." These are the most common practices of the effective sample but they are not necessarily the practices which distinguish the effective from the less effective group. (The distinguishing characteristics appear in Table 1B of Annex 1B).

Table 1A: Most Common Instructional Practices of Effective Teachers

CATEGORY	URDU Eff%	MATH Eff%	SCIENCE Eff%
Review	46	57	79
previous lesson	50	70	67
Preliminaries	88	77	92
turn to text	86	69	71
topic of lesson	84	68	83
objectives	X	83	83
Presentation	83	77	96

lecture method	58	X	67
definitions	50	X	79
examples	X	62	75
blackboard ex.	X	70	50
Clarity of present.	76	87	83
explanation clear	78	92	79
words appropri.	63	60	63
lang. understood	88	95	92
Tasks/guided prac.	90	96	89
textbook tasks	90	91	94
explan. tasks	X	X	67
repetition task	55	X	50
reading practice	68	X	X
show underst. tasks	66	X	72
basic facts tasks	X	53	72
writing task	58	X	X
watch demon. tasks	X	X	61
Response expected in guided practice			
one correct ans.			
showing know.	55	80	72
name parts of item	X	X	56
Activities: guid. pr.			
seat work	66	93	53
respond orally	X	X	77
Signs of understanding at the end of guided practice.			
ch. answer corr.	58	51	56
many ch. raise			
hands	50	X	72
teach. asks	76	76	83
ch. wk. wo			
hesitation	63	80	67
Teacher feedback			
<u>for correct ans.</u>			
praise	X	60	67
teach. repeats ans.	68	60	83
teach. says "yes, bec"	58	X	67
<u>for incorr. ans</u>			
teach. simplifies	53	64	83
teach. hints	X	60	61
teach. gives cor. ans	82	60	56
teach. expl; ch. redo	X	76	50
Independent pract.	89	73	70
seat work	93	86	87
practice writing	53	X	X
solve problems	X	56	X

textbook tasks	92	89	93
ch.come to teach. when finished	54	58	67
teach.walks around	54	69	67
ch.indicates need from seat	X	64	X
fdbk to individs.	X	X	53
fdbk to whole gr.	X	61	X
Homework assigned	29	35	33
explan./answers	X	X	63
solves problems	X	80	X
rewrite mater.	53	X	X
pract.calligraphy	53	X	X
teach.corr.books	73	67	X
hmwk but not obs.	X	X	60
ch.corr.mistakes	77	80	60

(Other findings will be added when the analysis is complete)

Note: Percentages may add up to more than 100 because of multiple answers.

ANNEX 1B

Instructional Practices Which Distinguish More and Less Effective Teachers

Table 1B identifies those practices which distinguish the more effective from the less effective sample by their greater or lesser incidence in the more effective group. Those practices reported may not, however, be used by a majority of the more effective sample. The general category shows the incidence of a practice in the whole sample, while the subsumed practices are reported as a percentage of those who use the general practice. The first number represents the more effective group and the second number the less effective group. A difference of ten or more percentage points is considered worthy of comment in the subsumed practices. It is important to note the direction of the difference.

Table 1B: Instructional Practices Which Distinguish Effective From Less Effective Teachers

CATEGORY	SAMPLES		
	URDU Eff:LE%	MATH Eff:LE%	SCIENCE Eff:LE%
Review	46:42	57:29	79:48
previous lesson	X	X	67:42
previous work	42:21	X	28:50
Preliminaries	88:88	77:77	92:78

turn to text	X	X	71:95
topic of lesson	84:75	X	X
objectives	X	X	83:19
Presentation	83:66	77:67	96:82
small steps w.prac.	23:39	X	29:18
lecture method	58:46	30:63	X
definitions	X	46:32	79:46
examples	X	62:46	75:27
blackboard ex.	X	70:59	50:23
teach.begins w. practice	X	35:24	21:55
Clarity of present.	76:61	87:72	83:52
confusing present.	X	14:32	25:50
explanation clear	78:55	92:66	79:36
words appopr.	63:39	X	63:27
lang.understood	X	95:83	92:82
Tasks/guided prac.	90	96	89
textbook tasks	90	91	94
explan.tasks	X	X	67
repetition task	55	X	50
reading practice	68	X	X
show underst.tasks	66	X	72
basic facts tasks	X	53	72
writing task	58	X	X
watch demon.tasks	X	X	61
Response expected			
one corr.ans.exp.			
showing know.	55	80	72
name parts of item	X	X	56
Activities:guid.pr.			
seat work	66	93	53
respond orally	X	X	77
Signs of under.after guided prac.			
ch. answer corr.	58	51	56
many ch.raise hands	50	X	72
teach.asks	76	76	83
ch.wk.wo hesitation	63	80	67
Teacher feedback			
<u>for correct ans.</u>			
no response	21:41	X	X
praise	X	X	67:54
teach. repeats	X	X	83:46

teach."yes, bec." <u>for incorr.ans</u>	58:34		67:46
teach.simplifies	X	64:50	83:47
teach.hints	34:47	60:48	X
teach.gives corr.	82:63	X	X
teach.goes to next child	11:22	X	0:21
teach.expl;ch.redo	42:28	76:61	50:31
Independent pract.	89:55	73:54	70:65
seat work	X	X	87:100
small gr. work	0:15	X	X
explan. tasks	X	29:40	X
copy material fr. text	X	X	47:35
copy from guid. practice	33:46	X	X
practice writing	X	X	20:47
recite out loud	10:23	X	X
practice reading	X	X	40:53
copy meanings	22:12	X	X
copy labels	X	X	29:0
teach. creates some or all tasks	X	14:24	0:18
textbook tasks	92:77	89:73	X
task source:copy fr. guid.pr.	X	X	33:6
task source:rework fr. guid.pr.	X	39:23	13:0
teach.ignores ch. in ind. prac.	26:50	19:33	X
ch.come to teach. when finished	X	X	67:41
teach.walks around	X	X	67:53
ch.indicates need from seat	X	64:40	X
fdbk to individs.	44:56	X	53:35
fdbk to whole gr.	X	61:47	33:53
Homework assigned	29:33	35:19	33:19
explan./answers	33:19	0:17	63:20
write examples	20:38	13:25	X
summarize mater.	X	X	13:0
solves problems	6:31	80:68	X
rewrite mater.	X	47:17	25:60
memorize prose	X	X	38:20
memor. basic facts	X	X	25:0
origin.essay	X	0:83???	X
pract.calligraphy	53:19	X	X
artwork	27:6	X	X
ch.corr.mistakes in homework	77:56	X	60:100

(More practices may be added when the analysis is complete)

Note: Percentages may add up to more than 100 because of multiple answers.

ANNEX 1C

Explicit Teaching and Effective Instructional Practices

Table 1C summarizes the extent to which effective teaching practices identified through this study are similar to those found elsewhere in explicit teaching to be effective in increasing academic performance. The similarity is only reported when the practice distinguishes the effective from the less effective sample.

Table 1C: Explicit Teaching and Effective Instructional Practices*

CATEGORY	SAMPLES		
	URDU Eff.	MATH Eff.	SCIENCE Eff.
Begins a lesson with a short statement of goals;	O	O	X
Begins a lesson with a short review of previous, prerequisite learning;	X	O	X
Presents new material in small steps, with student practice after each step	X	O	X
Gives clear and detailed instructions and explanations	X	X	X
Provides active practice for all students;	X	X	O
Asks many questions, checks for student understanding, and obtains responses from all students;	X	X	X
Guides students during initial practice;	X	X	X
Provides systematic feedback and corrections; (consistently uses more appropriate types of feedback)	X	X	X
Provides explicit instruc-			

Provides explicit instruction and practice for seat-work exercises and, where necessary, monitors students during seat work;	X	X	X
Continues practice until students are independent and confident.	?	?	?

* Behaviors which distinguish the effective group in a way that is noteworthy or consistent across categories are marked with an "x".

1. See Montero-Sieburth, Martha 1989. Classroom Management: Instructional Strategies and the Allocation of Learning Resources. BRIDGES, Harvard University: Cambridge for a literature review of this research.

2. The sample consisted of approximately 260 observations of instruction in Urdu, math and science in 32 schools of Pakistan. Eight schools were selected from middle range districts (neither the provincial capital nor the most remotely rural) in each of the four provinces of Pakistan. Lists of schools were then ranked on the basis of supervisor assessments to reflect a range of quality in classroom instruction. The best and worst of the schools were chosen to form a sample of effective and less effective learning situations, and from these lists schools were chosen to reflect approximately equal numbers of boys, girls, urban and rural institutions. There are two assumptions underlying sample selection: one is that by examining the extremes of instructional quality, it would be easier to identify the distinguishing features of effective practices, and, two, that the sample provide a middle range of schools typical enough of the largest proportion of Pakistani schools so that the findings would have relevance to school improvement programs in general. The sample is not and was not intended as a representative sample of Pakistani schools.

3. Initial fieldwork preliminary to the formal study convinced us that classroom practices could be collected for convenience under these headings.

4. In most cases and unless otherwise stated, numbers in the tables represent the proportion of the samples which manifest a particular characteristic. Usually when there is a ten percent or greater difference between the two samples, the difference is considered "noteworthy." When a difference is smaller yet the characteristic follows the tendency of related variables, positive or negative, then the event is reported as a "consistent

tendency." Otherwise, differences are usually considered too small for notice.

5. Rosenshine, Barak V. 1986. "Synthesis of Research on Explicit Teaching." Educational Leadership, April 1986:pp.60-69.

6. Assuming of course that the achievement tests are a fair measure of the product of the system.

UNIT C

Module 10

Objective(s):

1. To increase the awareness of policy-makers and managers of the importance of reducing repetition rates and increasing the flow of students through schools.
2. To provide policy-makers with concrete suggestions of ways to reduce repetition rates.

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Introduction

The objectives set for education systems, like other human endeavors, generally require more resources than are available. We are forced, therefore, to reduce our objectives, and to look for ways to be more efficient in the use of resources. Efficiency is understood here as increased when we are able to increase outcomes without increasing use of resources.

In education, two major objectives are pursued:

- a. to maximize the proportion of eligible children who attend and complete school; and
- b. to maximize the quality of the education provided, or the amount of learning of each student.

If resources are fixed, then an increase in the use of resources to increase enrollments, for example, spending on buildings, equipment and materials, will mean that fewer resources are available to sustain the quality of education. We may have to hire fewer teachers or increase class sizes. In general, attempts to increase access directly have no positive effect on the quality of education and can often actually reduce that quality.

Fortunately, however, it is possible to both improve quality and increase access in systems in which internal efficiency is low. Spending to improve quality can reduce the amount of teaching required to service the same number of students, thereby reducing the overall level of resources required to keep the system where it is.

Think of the education system as a pipe through which students flow. If we reduce the diameter of the pipe, fewer students can flow through it. If we squeeze the pipe in the middle, this cuts down on the flow of students to the higher grades. But, it also means that a bulge occurs in the pipe as students back up trying to get through the narrow opening. The backup of students already in the pipe means that fewer children are able to enter the pipe at its mouth. High repetition rates reduce the capacity of the system to admit new students (see Figure 1 on page 3).

In this module, we will demonstrate that student repetition is the major cause of this kind of backup, and that reductions in repetition rates through improvements in quality can lead to increased access to the system. Repetition is an indicator of inefficiency, but is not itself the cause of that inefficiency.

Which is More Important, the Repeater Rate or the Dropout Rate?

Research on student behavior indicates that most students who fail a grade will, if allowed, repeat the grade at least one more time. In fact, students will stay in the same grade for several years before finally dropping out.

This should not be surprising. The opportunity costs of schooling for most young children are extremely low. Even when children do make a contribution to the household economy, that contribution generally can be made outside school hours. An examination of enrollments by age shows that the number of children in a given age group steadily increases from the entry age, up to 10 or 11 years of age, and then declines. In most countries, 10 or 11 years of age is when children in poor families are more likely to be asked to contribute to household income, or when girls are likely to be withdrawn from school as they near puberty.

Figure 1

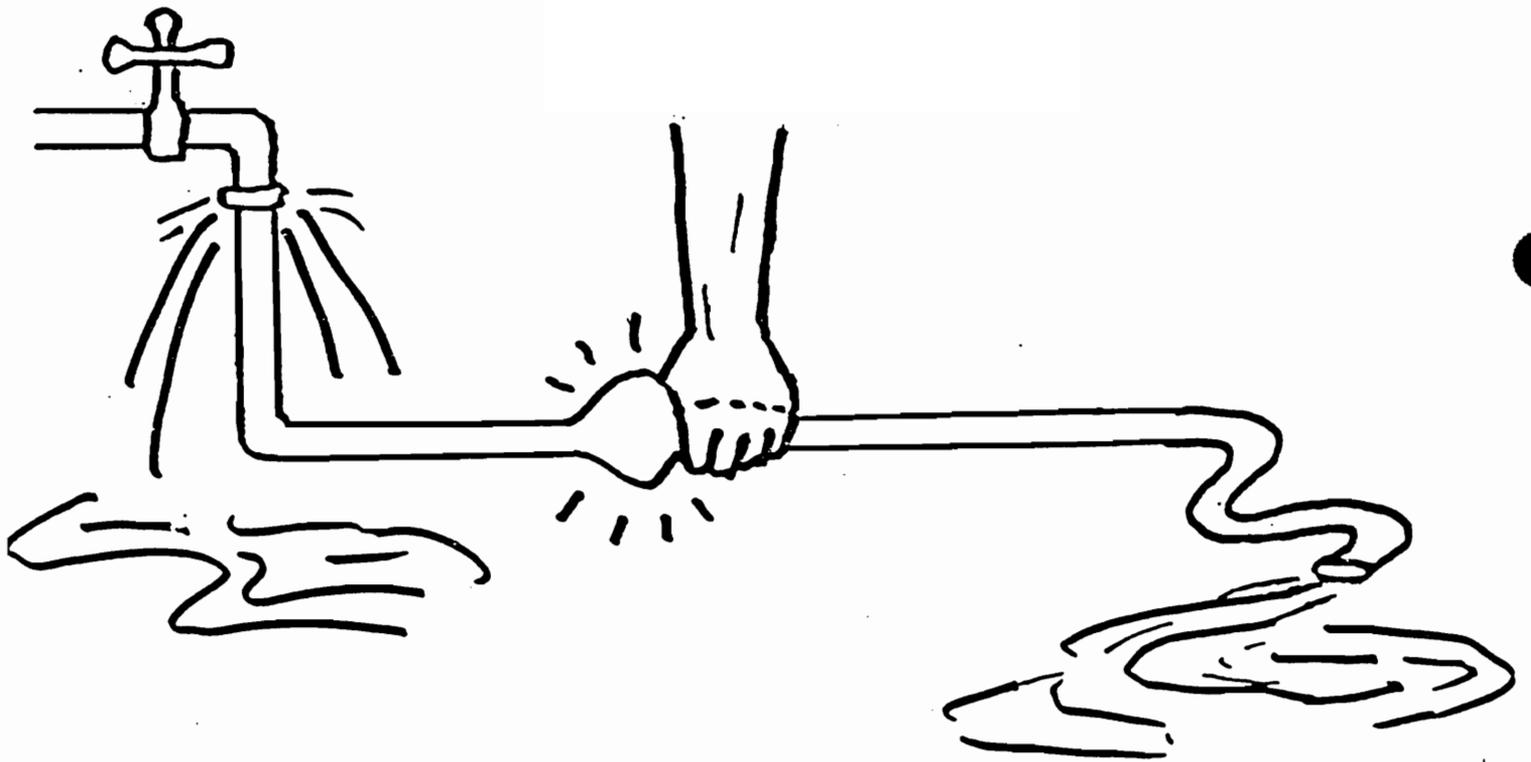


Table 1
Participation Rates for
6 to 10 Year Olds in Honduras
in 1978 and 1984

<u>Age</u>	<u>1978</u>	<u>1984</u>
6	28%	33%
7	67	80
8	76	84
9	78	83
10	77	78

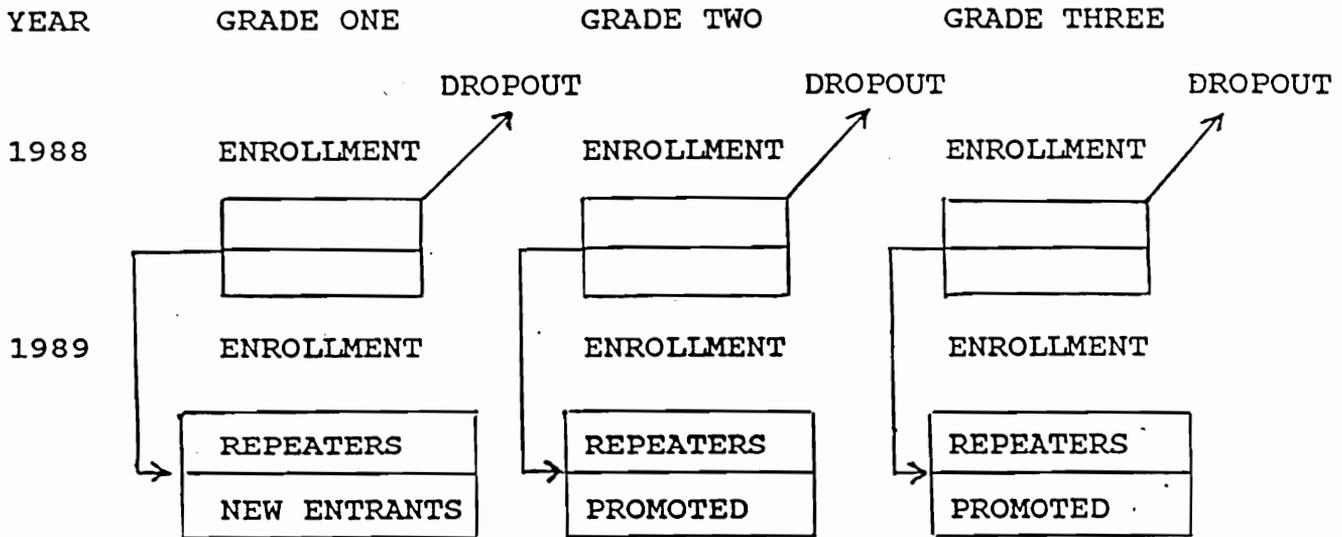
Source: Cuadra, Indicators of Student Flow Rates in Honduras, BRIDGES, 1989.

Table 1, based on figures from Honduras, shows participation rates (proportion of age group enrolled) between ages 6 and 10, for two periods. What these figures suggest is that children enter school at age 6 and later, but that they stay in school, no matter what grade they are in, until about 10 years of age, when they begin to drop out.

Official publications in some countries, including Honduras, report high dropout rates and low repeater rates in the lower primary grades. The reported statistics suggest that most children drop out after one year of school. If that were so, we would expect to find that participation rates would decline at an earlier age than they actually do. What the figures in Table 1 indicate, and field research has shown, is that estimates of repetition and dropout rates by the Ministry of Education are inaccurate. In fact, dropout rates are low and repeater rates are high. The issue can be seen more clearly by reviewing how these rates are calculated. Promotion rates generally are calculated on the basis of decisions made at the end of the school year. The assumption is that all promoted 1st grade students will go on to the 2nd grade. Some of those who failed will repeat the 1st grade and some will leave school. Figure 2 (see Figure 2 on page 5) shows the three things that can happen to a child once enrolled: be promoted, fail and repeat, or drop out.

Figure 2

MODEL OF STUDENT FLOW THROUGH SYSTEM



$$\text{DROPOUTS} = \text{TOTAL NUMBER IN GRADE YEAR BEFORE} - \text{PROMOTED} \\ - \text{REPEATING}$$

Those who repeat the grade can be counted, but those who leave school are of course not counted. These "dropouts" are estimated as the difference between the total number in the original cohort, minus the sum of those promoted or repeating.

$$\text{Dropouts} = \text{Total Number in Grade Year Before} - \text{Promoted or Repeating}$$

If the number of students who are repeating is underestimated, then the number of students assumed to have dropped out is overestimated. Assume a cohort of 100 students entering 1st grade in 1989. Let us say that 65% pass the exam at the end of the year and are promoted to 2nd grade. Now, in 1990, the 1st grade teacher is faced with another 100 students. If the teacher counts only 10 repeaters, then it is assumed that 25 students dropped out.

That means that there are 90 new places in 1st grade. But, assume that the true number of repeaters is 25, and the number of dropouts only 10. That would mean only 75 new places in 1st grade. A high rate of repetition can, therefore, reduce the intake rate (that is, the number of new students admitted to grade 1 over the total number eligible to enroll).

Research in a number of countries has shown that teachers regularly overestimate promotion in the early grades, and underestimate repetition rates. The problem is most severe in the 1st grade, where it is difficult for teachers to distinguish between students enrolling for the first time in their life, and those who were enrolled the year before, perhaps in a different school or with a different teacher.

In some countries, the difference between the true rates and the Ministry of Education estimates is quite large as, for example, in Honduras (see Table 2).

Table 2

<u>Year</u>	<u>MOE</u>	<u>True</u>
1979	27.3%	51.8%
1980	26.7	54.1
1981	26.1	57.6
1982	28.0	50.1
1983	27.3	50.7

Source: Cuadra

The conclusion to be drawn from these findings, and similar results from other countries, is that in the lower grades of primary schools, repetition rates are much larger than dropout rates.¹

The Effect of Repetition on Enrollments

Although it is customary for planners to worry that high population growth rates will exceed the ability of the system to provide access to all children, in fact, repetition is a more serious threat.

To visualize this, imagine a country with a two-grade school system which admits all eligible children to the 1st grade. We have constructed a flow model which allows us to see the impact of different rates of population growth and different rates of repetition on the number of students enrolled in the system in a given year. These are shown in Figure 3 on page 8.

There is little difference between the shape of the enrollment curve when the population growth rate is 6% per year as compared to 3% per year. There is, however, a great difference when the repetition rate is 40% as compared to 10%. The difference is in the number of children who must be served in the education system. As the number that enter the system is the same in both cases, the differences in enrollments to be served is a result of repetition.

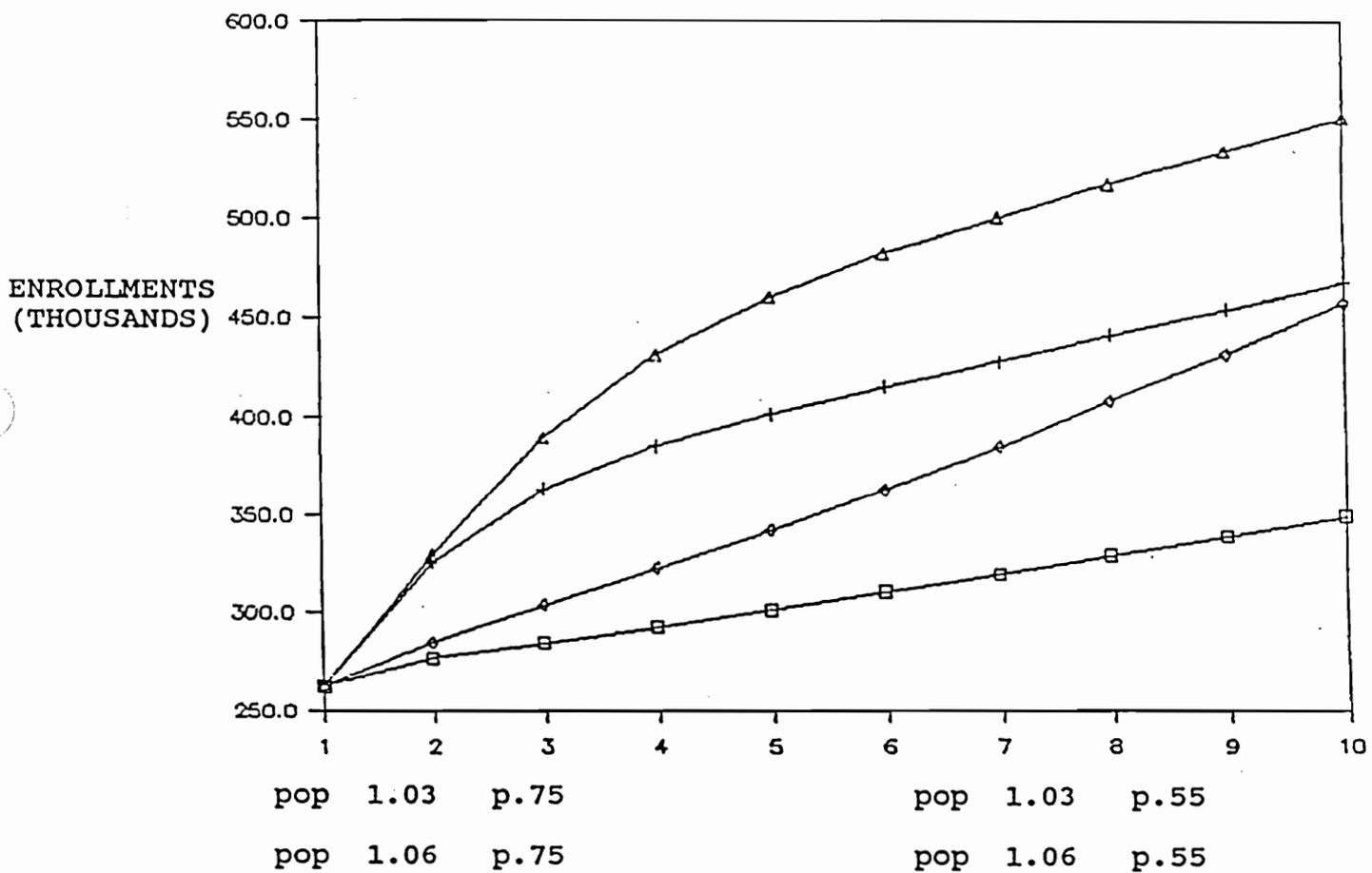
Repetition rates, especially in the lower grades, are often higher than 10% and can go up to 50%. That is, the repetition rates are almost always several magnitudes greater than population growth rates.

¹ BRIDGES has developed a software package, STEP (System for Tracking Educational Progress), that will estimate repetition and dropout rates, and provide long-term forecasts of the rate of change in these rates. The methodology, and other methods that can be used to improve estimates of rates, is included in the reading by Cuadra assigned to this module.

Figure 3

ENROLLMENTS IN TWO GRADE SYSTEM

VARYING POPGROWTH AND PROMOTION



The point here is that while high population growth rates strain resources, an even greater strain is caused by high rates of repetition or low rates of internal efficiency. The rate of flow of students through the educational system affects:

- a. Access of future cohorts of students. If there are limited physical facilities and/or teachers, a reduction in the rate of flow of students once enrolled reduces the space available for new students, that is, it reduces access.
- b. Supply of persons for the next level of the education system or for the labor market. Given a constant number of students entering the system, a reduced flow (through repetition) reduces the number of graduates.
- c. Efficiency of utilization of resources or the amount of effort the system must put out for a student to complete a year or cycle. The more times students repeat, the more years they will spend in the system. If on graduation those who have repeated know no more than those who went straight through, then the benefit/cost ratio is lower for those who have repeated.

The Cost of High Rates of Repetition and Dropouts

In countries with high repetition rates, the average number of years of instruction necessary to produce a graduate can be as high as 10 or more years for a 6 grade program. If each year of instruction costs, for example, 100 dollars, then each graduate costs \$1000 instead of the \$600 they should cost. It also means that for every 600 students graduated now, it would be possible to graduate 1000 students if the system were totally efficient.

Table 3
Cost in Student Years
of Producing One 5th-Grade Completer

<u>Income Level of Country</u>	<u>Year</u>		
	<u>1975</u>	<u>1980</u>	<u>1984</u>
Low	8.8	8.6	9.0
Lower Middle	7.6	7.4	7.2
Upper Middle	6.5	6.4	6.3
High	6.0	5.6	5.4

Source: UNESCO

Table 3 presents estimates of the number of years of instruction required to produce a "graduate" of a five-year program in various countries, organized according to the per capita income level of the countries. In the poorest countries, the number of years of instruction required was 76% higher in 1975 than it would have been had there been no failures or dropouts. The table also suggests that between 1975 and 1984 the situation in the poorest countries grew worse.

This information can also be presented in terms of the cost savings that could be effected if it were possible to reduce repetition and dropout rates. Table 4 indicates the savings to be expected in very poor and lower middle income countries by reducing repetition rates and dropout rates. Each 1 point reduction in the repetition rate would reduce costs in poor countries by \$7.9. A 10 point reduction in repetition, say from 20% to 10% per year, would save \$79, which is about 28 percent of the cost of a graduate. In other words, a 10 point reduction in repetition would mean that it would be possible to increase the number of graduates by 28 percent at no additional cost.

Table 4

Expected Savings in Recurrent Costs
from Reducing Rates of Repetition and Dropouts²

	<u>Income Level</u>	
	<u>Low</u>	<u>Lower Middle</u>
Average Cost to Produce Graduate	\$279	\$734
Savings Per Point Reduction in <u>Repetition</u>	\$ 7.9	\$ 22.3
in <u>Dropouts</u>	\$ 11.5	\$ 98.7

Measures of Efficiency Based on Student Flows

Given measures of student intake rates, promotion, repetition and dropping out for two or more years, it is possible to reconstruct the flow of a cohort of students through the system. From the cohort flow method one can calculate different measures of time that students spend in the system. Some of these measures are:

- a. Number of Student Years Spent in Each Grade by the Cohort;
- b. Number of Student Years Spent per Graduate;
- c. Average Duration of Stay in the Cycle;
- d. Ratio of Students Graduated to Students Admitted.

These are some of the indicators of efficiency that can be calculated.³

² The savings per percentage point reduction is larger for dropouts than for repetition, but it should be kept in mind that the repetition rate is generally several times higher than the dropout rate and that reduction of repetition also reduces the dropout rate.

³ For a detailed review see Douglas Windham, Indicators of Educational
(continued...)

Factors that Affect Student Flows and Internal Efficiency

Central Policies with respect to Rates. Rates of intake, promotion and repetition are often set by policies from the central administration. For example, some countries specify that teachers may fail no more than a fixed percentage of their students. In some systems, teachers in lower grades must pass all their students. Egypt, for example, specifies that all children in 1st, 3rd and 5th grades should be promoted to the next highest grade. Teachers are not allowed to fail students in those grades. However, failure and repetition are allowed in grades 2, 4 and 6.

Repetition and Dropouts Caused by Lack of Opportunity to Continue in School. In some countries, dropouts are determined by the lack of space in higher levels. For example, rural youth who have completed a three year cycle are likely not to continue school if 4th grade attendance requires leaving the village and incurring higher costs for schooling.

In countries in which returns to schooling are high, and entrance into the next cycle is restricted, students are likely to repeat the last grade in the lower cycle, waiting their "turn" to be admitted to the next higher level. In Burundi, for example, a national examination selects the small fraction of students who will be admitted into secondary school. Many students whose examination scores are below the admission point repeat the 6th grade of primary hoping to improve their scores. From the students' perspective, this is a reasonable action: repeating grades does help raise examination scores. But the effect on the system is to raise overall costs to the government, and to reduce space available in the 1st grade for the next cohort of students seeking to enter school.

Low Demand for Schooling as a Cause of Dropouts. Students stop attending school when the return perceived by students or their families is less than the perceived costs. The costs may be economic or non-economic. Economic costs include both the direct costs incurred because of school fees, costs of materials, books, clothing, transportation, and opportunity costs (for example, income or services foregone when the child is in school). Non-economic can include threats to the security of children, especially important for girls. Research shows, for example, that dropout rates increase sharply when children have to walk more than 1.5 miles to school.

³ (...continued)

Effectiveness and Efficiency (Tallahassee: Florida State University, Improving the Efficiency of Educational Systems Project, 1988); and Cuadra.

Dropout rates often are associated with the gender of the student because of family attitudes about the relative value of schooling. In those countries in which the return to additional years of schooling is higher for girls than it is for boys, girls are less likely to drop out than are boys.

Failure as the Major Cause of Repetition and Dropouts. As noted above, research indicates that the major factor linked with dropping out is failure in the grade. Students who fail are seen by their families as lacking ability to benefit from further schooling, and may be withdrawn to avoid further spending on schooling or to help produce income for the household. Typically, children must fail several times before this decision is made. Most dropouts in primary school occur after a child has spent several years in the school. Children who have never failed are much less likely to drop out from school than those who have failed.

The most powerful factor affecting repetition and dropout rates is, therefore, the promotion rate. Increased promotion means less failure, less repetition, less dropping out and higher efficiency.

Actions to Reduce Repetition and Dropouts

Several countries have attempted to reduce failure and consequent repetition and dropouts by requiring teachers to increase the proportion of children promoted. This kind of policy can be successful when:

1. Teachers are provided with training, materials and conditions that result in increased learning by students; and
2. Teachers and parents are educated to accept the principle that the school's objective is to teach all children, not to select those who are capable. It should be kept in mind that in some countries of high academic standards (e.g., Japan and the United States) it is expected that all but a tiny proportion of children will reach the end of primary school without failure.

High rates of repetition and dropouts in rural areas are in some countries attributable to lack of facilities and teachers. Some countries have found that it is possible to increase the proportion of children who complete the primary cycle through more intensive use of facilities and teachers, for example, through double shifts and multigrade classrooms. In some countries, distance learning methods have increased attendance and completion rates at relatively low cost.

The boarding school originally served to increase school attendance and completion, but has now proved to be too expensive a solution. The same objective, that of reducing the cost burden of schooling of the poorest families, has in some countries been achieved by providing scholarships to needy students. Scholarships reduce dropout rates.

Policies to increase promotion are of two kinds: policies to improve overall quality of schooling, and policies to provide remedial assistance to failing students.

Remedial programs to reduce dropouts begin by identifying students most likely to drop out. These are students who have failed often, who are not integrated into the life of the school, or whose presence in school is not actively supported by the family. The three factors are linked to each other, but we can distinguish between remedial programs that focus on the student's academic practices; programs that attempt to integrate the student more fully into the school; and programs that work with the student's family to increase support for activities in the school. Age of the student is a critical factor: when boys and girls approach the age of puberty, or the age of employment, they are more likely to leave school, especially if their academic record is weak.

Remedial academic programs are of two kinds. Conventional programs increase the amount of time spent on learning and work on learning practices. In many countries, out of class tutoring for students has been a successful solution to academic failure problems. Failure in school for older children has been reduced by the use of accelerated programs. These typically reduce the curriculum to the bare essentials, and provide intensive training over a short period of time. It is possible for students to learn in 3 years enough to pass the 6th grade equivalency examination. Accelerated programs motivate students who are eager to enter the labor force or to quit school for marriage.

Programs that focus on integration of the student into the life of the school provide a series of non-academic services addressed to issues such as physical and mental health, and family relationships. Programs that focus on the student's family attempt to train family members to provide the student with incentives for continuing in school. There is little systematic research to assess the effectiveness of these kinds of programs.

Remedial programs can help to reduce failure, repetition and dropouts, but they increase the cost of providing the educational service. Because they do not remove the original cause of the problem, they do improve efficiency.

Schools are designed to enable all children with minimal levels of intellectual ability to complete the curriculum and meet basic minimal curriculum objectives. Most failures in school are the result of the school's failure to correctly implement the curriculum, rather than the result of some deficiency in the student or in the student's family. The most effective response to problems of high failure, repetition and dropping out is, therefore, to improve the implementation of the curriculum. In most cases, this can be done without large increases in resources so that the result is increased efficiency.

Schools are most effective and efficient when:

1. teachers teach the curriculum, and
2. students spend their time trying to learn that curriculum.

Modifications in the quality of teaching and in the quality of learning will further increase overall learning. The quality of teaching depends principally on 1) personal qualities of the teacher such as knowledge of the subject matter and basic teaching skills, and 2) the quality of teaching materials including the textbooks. Health and the stability of the home affect the student's ability to learn.

The time teachers and students spend on teaching and learning is increased when:

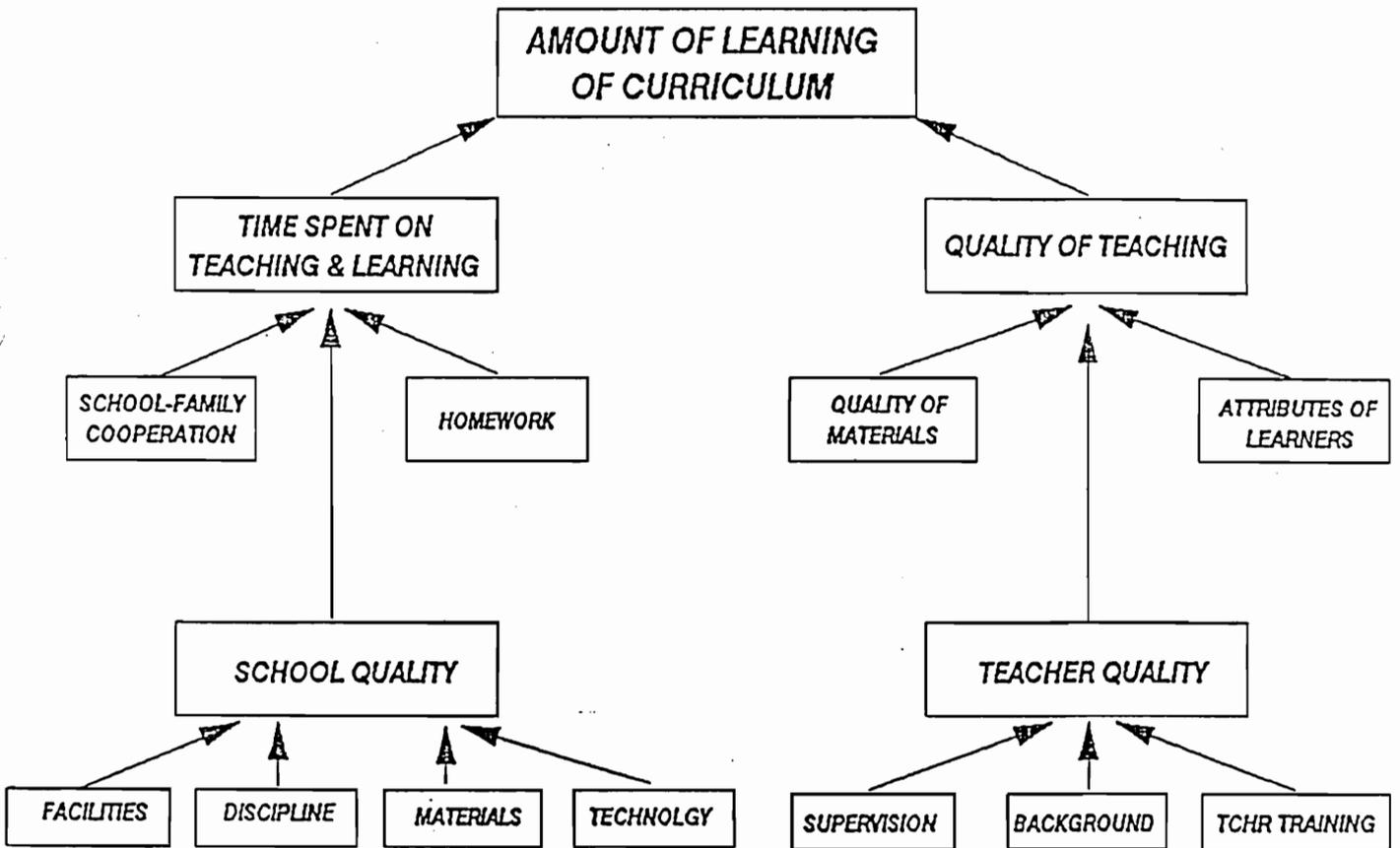
1. materials which contain the curriculum are available;
2. teaching methods focus attention on the curriculum;
3. time on the curriculum is not reduced by problems of student discipline; and
4. physical facilities permit focusing on learning the curriculum.

Time spent on learning is also increased by activities outside of school. Assignment of homework, use of textbooks, enlistment of family support all help to increase time spent outside of school on learning.

These factors are displayed on page 16 in Figure 4, which is based on material presented in Module 11. Most of the actions that can be taken require little additional expenditure; most require a reallocation of present resources. Time is the more important of the resources to be re-allocated.

Figure 4

FACTORS THAT INCREASE LEARNING & REDUCE FAILURE



Ministry policies can help to reorient how teachers and students spend their time in order to increase the time spent on the official curriculum. Teacher training policies can change the methods teachers use in instruction, and can focus teacher attention on curriculum objectives. Introduction of instructional materials can increase student and teacher time. Teachers can be encouraged to teach all children, especially those whose intellectual abilities and home environment make it more difficult for them to learn the curriculum. Teachers can be encouraged to raise expectations for student progress, and therefore, to reduce the likelihood that students will fail and repeat or drop out.

More details on policies to improve educational quality are contained in Modules 3 and 11.

ACTIVITY (1)

Ask the participants to develop their own spreadsheet version of a flow model. They can then experiment with different levels of student repetition rates to see the effects on overall completion rates and the requirements for buildings and teachers. A Lotus 1-2-3 model can be used by the participants.

Third World School Quality

Current Collapse, Future Potential

BRUCE FULLER

STEPHEN P. HEYNEMAN

Eager to boost literacy, economic growth, and national institutions, Third World governments and international aid agencies have greatly expanded schooling since the 1950s. Enrollments have quintupled since the late '50s, from 100 million children to now more than 500 million. The sharp economic decline felt over the past decade throughout the developing world, however, has led to deep cuts in education budgets. Child populations are doubling every 20 years in many countries. Popular demand for primary schooling, as manifest in enrollment rates, continues to skyrocket. This conflict between ever-rising enrollments and falling resources is severely eroding school quality. We detail and illustrate this collapse of educational quality, calling on North American educators to recognize this quiet crisis and to contribute to its remedy. In addition, we map out a strategy for attacking the problem, drawing on the growing body of Third World research and new initiatives coming from international organizations.

Educational Researcher, Vol. 18, No. 2, pp. 12-19

Luckily, the glass windows of this tiny mud classroom had long ago disappeared from their crudely carved frames. Otherwise, the steaming African heat would have felt even more oppressive. It was like walking into a warm, damp greenhouse. Then the human contribution to this tropical stuffiness hit us as well: 75 children, varying in height but all thin, packed this schoolroom, arranged in tidy rows. As we entered the classroom, the shuffling of bare feet against the dusty stone floor gave way to a loud and crisp, "Good morning, sirs!"

This respectful greeting was characteristic of many other disciplined pupils and earnest teachers we had observed. The social cohesion of African classrooms is always striking, whether it stems from traditional respect for village authority, an old colonial headmaster, or perhaps a Western school effectiveness guru.

The rich social fabric of this second-grade classroom contrasted sharply with its most visible feature: material poverty. Only one in three children had access to reading material of any kind. Pupils without desks huddled together on the rock-hard floor. Five or six children passed a single pencil among themselves, jotting down brief phrases as dictated by the teacher. From outside, this mass of children sounded like a melodic chorus as the teacher energetically demanded that they repeat basic vocabulary words in unison. Despite their eagerness, fewer than half of these slight children would stay in school through the fourth grade.

Rapid School Growth, Declining Resources

Since World War II, Third World political leaders and international agencies have counted heavily on the rapid con-

struction of schools, believing that strong social and economic benefits would result. In the 1950s, governments reported that one third of their children were enrolled in primary school. Today this rate exceeds 70%. Almost 800 million youngsters will be attending Third World schools by the year 2000 (UNESCO, 1983). With child populations doubling every 20 to 30 years, Third World leaders feel enormous political pressure to maintain this breakneck pace of school expansion.

Rocked by a hostile world economy and always-fragile domestic political conditions, government expenditures for education have, at best, leveled off in most developing countries. Many Third World governments now earmark up to one third of their annual budget for paying off foreign debt. The basic economic barometer, GNP per capita, has remained static in much of the Third World, or fallen in the case of Africa, over the past decade. Because of this economic crisis, the share of all government spending allocated for education in the poorest countries has fallen from 16% to 12% since 1970 (World Bank, 1987, 1988).

Signs of Eroding School Quality

The conflicting forces of population and enrollment growth pitted against recurring economic decline pushes education ministries to spread scarce resources ever more thinly. The resulting free-fall in school quality is visible in many cases:

- In the African nation of Malawi, the pupil-teacher ratio in primary schools has climbed from 41:1 to 63:1 since 1970. Per-pupil spending has declined 4.1% each year in real terms. Only 50¢ is now spent annually per pupil on textbooks, writing pads, and other instructional supplies.
- In Nepal, one third of all teachers have no more than a primary school education. Education spending has remained stagnant over the past decade—equaling \$11 per pupil. Fewer than one third of all children reach the fifth grade (Cieutat & Pigozzi, 1988).
- In relatively affluent Latin America, the foreign debt crisis

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has decimated governments' capacity to support basic education. Per-pupil spending at the primary level has fallen by 40% in Mexico since 1980. In northeast Brazil, one third of all teachers have completed 4 years of schooling or less (Armitage, Batista, Harbison, Holsinger, & Helio, 1986).

- In Somalia, one fourth of the teaching force quits the profession each year. The number of textbooks printed last year equaled one fifth the number published a decade ago. The absolute number of pupils enrolled has fallen by 27% since 1980 (Smyth, 1987).

Inferences about educational quality stem not only from such information on material resources (or inputs) available to schools but also from evidence on pupil performance. Findings from the first international evaluation of achievement, for instance, revealed that just 1 out of 10 Third World students at age 14 was as literate in the language of instruction as the average pupil from an industrialized country (Thorndike, 1974). Average reading scores in developing countries, such as Chile and India, were half the level found within industrialized nations. We must be sensitive to cultural differences in how curricula are organized and achievement is measured, yet schools around the world are charged with imparting such basic literacy skills.

In defining "school quality," we start with student achievement, then back up to specify those instructional materials and teaching practices that most effectively boost achievement. For instance, evidence on the consistent impact of adding more textbooks to Third World classrooms is summarized below. By focusing on materials and practices that make a difference, this definition emphasizes the concentration of instructional resources available to each student. As enrollments expand more rapidly than do available resources, quality erodes relentlessly. This threatens the potential payoff from schooling in terms of higher literacy, social gains, and economic returns. Empirical investigation of these school factors requires that we control on pupils' family background—which shapes cognitive proficiencies, health and nutritional status, as well as ongoing demand for children's labor.

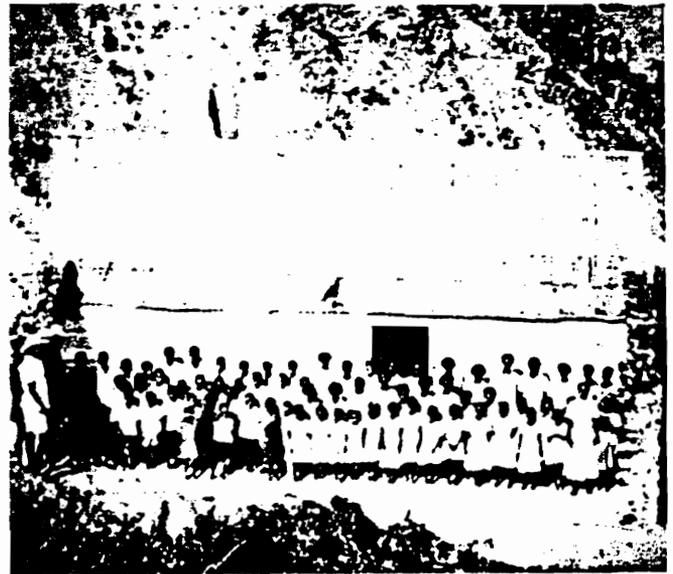
The Potential Impact of School Quality

Some critics argue that efforts to improve school quality will not make a dent in low student performance. They emphasize that pupil performance is low in the Third World because of children's impoverished out-of-school settings and the resulting nutritional and cognitive harm done. Parents' strong demand for children to work in the fields, the household, or the streets also takes them away from the classroom. This diagnosis of the problem suggests that fundamental economic change is required before an independent effect of school quality can be observed.

In addition, did not the Coleman report (Coleman et al., 1966) and the British Plowden report (Peaker, 1971) conclude that variation in the material qualities of school make little difference in contributing to pupils' achievement, relative to the influence of family background? Two decades of research following this initial finding does point to social and pedagogical practices (not just material inputs emphasized by Coleman) that yield significant achievement effects. The teacher's use of instructional time, the amount and type of curriculum covered, and certain student questioning practices, for instance, all appear to boost achievement significantly (Ralph, 1988; Rutter, 1983). Yet Coleman's basic

conclusion still stands within industrial societies: The child's background explains a greater portion of the variation in youngsters' achievement and eventual occupation attainment than do qualities of the school.

This pessimistic finding continues to be generalized to Third World settings. One early and influential paper concluded that variation in school quality was not strongly related to pupil achievement, net the influence of children's family background (Simmons & Alexander, 1978). This review was based on just nine empirical studies from the Third World. Yet the authors' inference fit nicely into the intellectual climate: Because schools allegedly reinforce social



Courtesy of the Canadian International Development Agency.

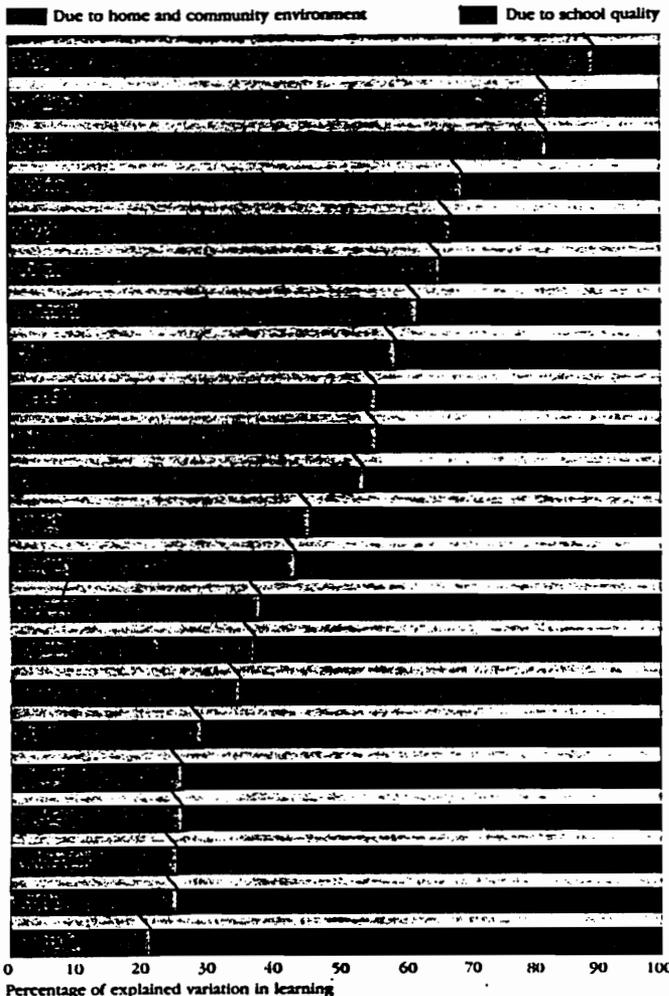
class inequities, variation in quality could not override differences in pupils' family background.

Yet evidence emerging over the past decade, grounded in more than 60 multivariate studies, now demonstrates that even basic school inputs (like textbooks or simple writing materials) exert a significant influence on pupil achievement in developing countries. Family background undoubtedly plays a role in determining children's school achievement. But the independent influence of school factors appears to be much greater in the Third World than within industrialized countries (for a detailed review of this research, see Fuller, 1987).

One study devised a school quality index based on survey data from 16 developing and 13 industrial nations. Straightforward indicators were used, including the number of textbooks and desks available, the length of the instructional program, and the educational level of teachers. For industrialized countries, the level of school quality tended to make little difference in shaping achievement after taking into account pupils' family background. Such basic elements

of quality, however, consistently exerted an influence on achievement within developing countries. For instance, nine tenths of the explained variance in the achievement of children in India was accounted for by differing levels of school quality. Family background and other preschool influences accounted for the remaining one tenth. The reverse

FIGURE 1
Influences on Primary School Science Achievement



Source: Stephen P. Heyneman and William Loxley, "The Effects of Primary School Quality on Academic Achievement across Twenty-Nine High- and Low-Income Countries," *American Journal of Sociology*, vol. 88 (Mar. 1983).

Note. From World Bank, 1986. Used by permission.

held true for industrialized countries, like Australia, where three fourths of the explained variance was attributable to family background and only one fourth to variation in school quality (Heyneman & Loxley, 1983). Figure 1 illustrates this general pattern.¹

Recent evidence also suggests that the long-term economic

effects of schooling stem as much from quality improvements as from enrollment growth. One longitudinal study of 1,205 young Chileans found that the quality of school attended was related to the status of their first job, controlling for the effects of family background (Schiefelbein & Farrell, 1984). Quality was measured in terms of textbook availability, teachers' educational level, and the character of school facilities. A similar study of 6,171 young Brazilian males found that the quality of their schools influenced postschool earnings as strongly as did the length of their school attendance (Behrman & Birdsall, 1983). School quality may operate, not surprisingly, through the child's achieved literacy level to help shape eventual occupational status. For instance, a recent study conducted in Kenya and Tanzania found that reading proficiency levels attained in school helped explained later income levels (Boissiere, Knight, & Sabot, 1985). Cognitive skills nurtured in school also are related to later success in the informal labor market (Eisenmon, 1987). A historical study of school expansion in Mexico found aggregate economic effects from improvements in educational quality, not only from enrollment growth (Fuller, Edwards, & Gorman, 1986).

Why is school quality in the Third World a potent influence on student achievement and eventual economic gains compared to the more limited effect found within industrialized nations? First, the baseline level of quality in the Third World is very low relative to the U.S. or western European countries. Many schools lack basic textbooks, desks, and even simple writing materials. In these settings, incremental infusions may substantially improve students' opportunity to read, write, and discuss organized lessons. In industrialized settings, where the typical level of material inputs is much higher, the impact of marginal variation appears to be more limited. Second, written literacy and numeracy skills are relatively scarce in most Third World countries; the few young people who effectively obtain these skills are more frequently rewarded. Third, because the use of the written word in agriculture, commerce, and law is novel in many cultures or social classes, the school becomes the exclusive provider of this new form of competence. Within North America and Europe, literacy was actively taught by local churches and parents long before the advent of government schools. But these local sources of instruction are much weaker in many developing countries.

Recent concern over eroding school quality, and the recognition that ameliorative measures can yield strong benefits, have helped to shift educational investments made by development agencies and governments. Before 1967, the World Bank justified educational investments on the grounds that more highly educated "manpower" was required. This usually implied projects emphasizing school construction at secondary and university levels. By 1982, however, the proportion of World Bank lending for new school construction had fallen from 85% to 37%. Improvement in school quality has become the major focus of this one donor's portfolio. The number of projects financing textbook production, for instance, rose from 3 to 37 over this period.

Despite this growing awareness of the problem, solid evidence is just beginning to emerge around related questions. First, what are valid indicators of "school quality," and how are they changing over time? Second, when gov-

each year, whereas Brazilian teachers spend four times as much, about \$4 per pupil, on instructional materials. By contrast, annual expenditures on learning materials in industrialized countries, like Sweden, exceed \$300 per student.

A commonly employed indicator of "school efficiency" in the Third World is the share of pupils that persist to the fifth grade. This indicator does not really pinpoint the school's independent effect because school-leaving may be more related to parents' demand for their children's labor and cultural practices (especially with respect to gender differences) than to qualities of the school itself. Nevertheless, the statistic is telling. Among the poorest developing countries, just 54% of all pupils persist to grade 5. In sub-Saharan Africa and south Asia, just one third of all entering students make it this far in primary school (Komenan, 1987; UNESCO, 1983).

Efficient Strategies for Boosting School Quality

Given this evident crisis, what effective remedies can be pursued? Above all else, one must recognize and work within tight resource constraints facing developing countries. To assume that we can simply improve school quality by

TABLE 1
What School Factors Boost Achievement
in the Third World?

School factor	Number of studies	Number confirming achievement effect
Highly effective		
Textbooks and instructional materials	24	16
Years of teacher training	31	22
School library activity	18	15
Length of instructional programs	14	12
Pupil feeding programs	6	5
Less effective		
Reducing class size	21	5
Science laboratories	11	4
Teacher salaries	14	5
Pupil repetition of grades	5	1

Source: Fuller (1987). Used by permission.

spending more money is hopeful but quite unrealistic within the economic environment of most Third World countries. Therefore one must carefully target investments on those facets of the school that most efficiently raise pupil achievement. Research has contributed significantly to this latter issue over the past 15 years. Elsewhere we detail the findings from more than 60 Third World studies on what school factors do and do not appear to contribute to student performance (Fuller, 1987). These studies employed either

multivariate models that controlled for family background or experimental groups within a planned intervention (where textbooks or other instructional programs were introduced). Here we briefly outline the lessons learned from this growing body of empirical evidence.

First, teaching materials and related material inputs that are linked directly to teaching are related consistently to higher pupil achievement, after controlling for the influence of family background. Textbooks have been related significantly to higher pupil achievement in 16 of the 24 empirical studies that looked at this factor (Table 1). Note again that variation in these fundamental inputs is not as strongly or as consistently related to higher achievement in the U.S. and other affluent countries. Yet given the scarcity of basic instructional materials in the Third World, even slight infusions can yield substantial learning gains (in Nicaragua, Jamison, Searle, Galda, & Heyneman, 1981; in the Philippines, Heyneman, Jamison & Montenegro, 1983; in Thailand, Lockheed, Vail, & Fuller, 1986).

Second, teacher quality often is related to higher student performance. Research thus far is limited by the use of proxies for "teacher quality," rather than more precise measures of specific pedagogical skills. But findings are instructive. For instance, in two thirds of all studies that examined the length of teachers' pedagogical training, significant effects on pupil achievement were found, net the influence of students' family background (for example, in Ghana, see Bibby & Peil, 1974; in Colombia, Arriagada, 1981; in Botswana, Heyneman & Loxley, 1983). Researchers have yet to isolate the elements of teacher training or classroom conditions that contribute to the competencies that teachers exhibit. One initial study from Malawi did find that teachers' knowledge of the math curriculum was related to the number of textbooks received, net the influence of their own social class background and other classroom conditions. Teachers were apparently becoming more numerate by reading and teaching from their pupils' texts (Fuller & Kapakasa, in press).

Third, research in developing countries is about a decade behind U.S. school-effectiveness literature in examining school management and classroom processes that may boost achievement. However, 14 Third World studies have included the length of the instructional program (expressed as hours per day or days per year) within multivariate models, and this factor has been consistently related to pupil achievement (in Tanzania, see Psacharopoulos & Loxley, 1986; in Thailand, see Lockheed et al., 1986). Only 8 studies have included the frequency with which homework is assigned to pupils, yet pupil achievement effects are found rather consistently. Beyond investigating these structural aspects of the school, little work has been done. Much remains to be learned as to how headmasters and teachers mobilize and organize scarce instructional materials.

Fourth, this body of research shows that the basic nutritional and health status of children can be a forceful determinant of achievement. A recent survey in Malawi found that one third of all pupils reported being hungry at least part of the school day (Mundangepfupfu, 1988; also in Uganda, see Heyneman & Jamison, 1980). Primary school headmasters in the Third World at times organize lunch for their pupils. These feeding efforts pay off in terms of higher achievement (in Guatemala, see Balderston, Wilson, Freire, & Simonen, 1981; in Egypt, see Hartley & Swanson, 1984).

Finally, several facets of the school may appear to signal higher quality, yet are not empirically related to higher levels of student performance. As mentioned earlier, more than 95% of many a Third World education budget is allocated to teacher salaries. However, only 5 of 14 empirical studies have found that variation in teachers' salaries is related to pupil achievement. Governments and international agencies are often eager to lower average class size, presumably as a way of raising school quality. Unfortunately, incremental reductions, though quite costly, appear to yield little return in terms of higher student achievement. This does not mean that large reductions in class size, such as those in many African classrooms, will not help. Yet smaller reductions from, say, 40 to 35 students per teacher are often debated. These decrements are not likely to yield significant gains in pupil achievement. Science laboratories hold enormous status in Third World secondary schools (just as a computer room does in U.S. schools), but they do not consistently boost student achievement and may not be relevant to teaching basic scientific concepts. Similarly, complex vocational curricula, though popular even at the primary level, also have proven to be very costly and hold little empirical impact on achievement (Heyneman, 1987).

Future Research Issues

School quality research in the Third World continues to be constrained by the troubling question raised in the 1966 Coleman report: Do schools make a difference in boosting children's achievement after one takes their family background into account? Governments and aid agencies, faced with criticism of their investment in education, continue to support research that documents the school's discrete effect. Large surveys are mounted, focusing on easily counted material inputs. Multivariate models are then constructed, building on the production-function metaphor from economics, to identify which school factors efficaciously raise achievement.⁴

The importance of this broad agenda should not be underestimated. Research in developing countries should, however, provide more textured portraits of life in classrooms. Production-function models emphasize learning that results from the simple insertion of physical goods into the classroom. In the Third World, this representation is accurate in some instances, as we have seen. Yet students of school effectiveness in the U.S. stress the importance of how resources are mobilized and managed by teachers and how these instructional tools are embedded in the classroom's social rules to motivate students (Ralph, 1988). These factors may be particularly important under conditions of material scarcity.

Anecdotes abound regarding the chalk-and-talk pedagogical method employed by many Third World teachers. But we have few concrete descriptions of how teachers interact with pupils, how student exercises are structured and evaluated, and what forms of knowledge are communicated (from accepted facts to debates over, for instance, normative issues in social studies). In short, we know very little about how teachers try to motivate children, or whether they attempt simply to maintain order when confronted by 50 or 60 young faces.⁵

As we get deeper into the social rules of schools and classrooms we run into normative as well as technical issues. The beauty of school-effectiveness research to date is that

it sticks closely to the technical task: Once a government decides its learning goals, this work helps define which material inputs best contribute to pupils' acquisition of this knowledge. Yet culturally defined social rules, in part, determine how headmasters manage and how teachers teach. These rules of social organization are often a hybrid of colonial and indigenous forms of authority, blended with some image of what "modern" pedagogy and knowledge should look like. These beliefs and practices define how the teacher

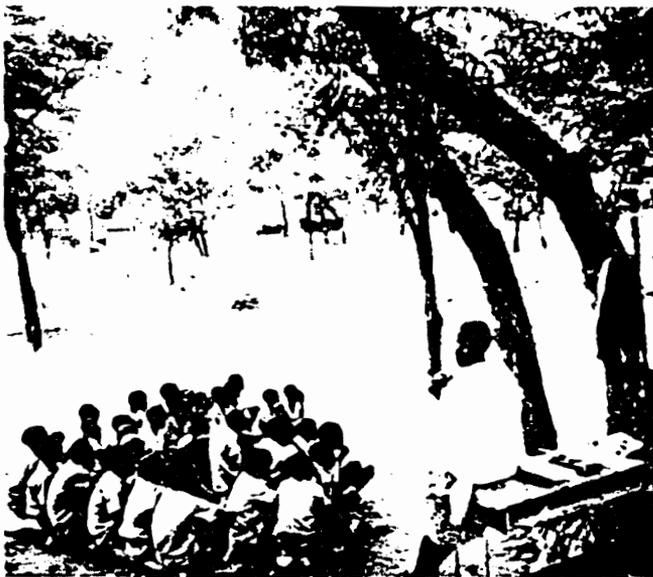


Photo by Bruce Paton; courtesy of the Canadian International Development Agency.

can legitimately act in the classroom, including the frequency with which questions are asked of pupils, whether questions call for a single fact or require more complex cognition, whether students work cooperatively on tasks or follow Western norms of individualistic competition. Yet we have very little evidence on how these deep social rules interact with the use of instructional materials to shape pupil achievement.

A final question remains: How can governments, local schools, and international donors signal more sharply the importance of improving educational quality? When a new school, replete with concrete floors and glass panes, goes up in a rural Bolivian village, people take notice. When a middle-class child in urban Nairobi attends a secondary school with a laboratory, his or her parents eagerly tell their neighbors. Rapid expansion of schooling, and the corresponding symbols of modernity and progress, hold significant currency. Finding equally persuasive signals of improvements in school quality is a more difficult task, especially for political leaders.

One positive example is the recent interest in reforming national examination systems, as found in China, Kenya,

and Malawi. Exams provide a tool for raising the visibility of government efforts aimed at boosting school quality. They also offer a potential lever for moving the curriculum away from the memorization of facts, so common in developing countries, toward more complex forms of knowledge and ideas (Heyneman & Fagerlind, 1988).

How Can American Educators Help?

When famine hits in Africa or an earthquake rocks Latin America, North American doctors organize quickly and head to the scene. When the Third World debt problem reaches a boiling point, the American banking community rises to lend (at least) a hand. Here self-interest melds with a broader concern for the developing world. Yet the much quieter collapse of educational quality in the Third World has attracted little attention among educators in the U.S.

What can American educators do that will make a difference? The U.S. educational community could provide desperately needed books and simple writing materials to English-speaking developing countries. Here national education associations could play an important facilitative role. Local school boards and principals also could encourage sabbatical programs, allowing teachers to work in the Third World for a year. A variety of private international organizations are able to facilitate such volunteer work. The expertise of American school administrators could greatly aid Third World education ministries, especially by working within governments that are moving toward greater local control of schools.

Encouraging signs are coming from Western governments and international agencies. The World Bank's president recently declared that his institution would give greater priority to education, signaling increased assistance for school improvement from this and other major donors. U.S. foreign aid legislation just earmarked greater support for improving basic education in Africa. What role American educators and researchers will play in these new initiatives will emerge over time. But opportunities for American educators to contribute are growing.

Scholars (from all disciplines) have shown a significant level of interest in figuring out how to boost the effectiveness of North American schools. A similar commitment to research on school quality in developing countries could yield important results. In some ways, U.S. research is far ahead, especially in pinpointing school management and classroom practices that yield strong achievement effects. Yet Third World schools present researchers with novel conditions: vast variation in instructional resources, teaching behavior, classroom structures, and family situations. Recent work on Japanese education has exposed the dangers of generalizing from North American assumptions and models regarding classroom organization and learning (see, for instance, Holloway, in press). Entering Third World classrooms, one is presented with even more surprises, puzzles, and intellectual challenges.

Finally, Third World families and educators have much to teach North Americans about how to make schools more effective when material resources are abysmally scarce. In the U.S., we have come to take schooling for granted. When educational quality appears low, educators often argue that more money is the best remedy. In contrast, Third World families' earnest commitment to education and teachers' extraordinary efforts persist, even in the face of material pover-

ty. The richness of this deep motivation and social cohesion, so evident in Third World schools, could provide important lessons for American educators.

Notes

Ms. Shehernaz Joshi helped in assembling the empirical data reported. Susan Holloway and ER's two anonymous reviewers offered very useful comments on earlier drafts. Financial support came from the University of Maryland and the World Bank. Views expressed herein do not necessarily represent policies of any organization.

¹Apportioning variance-explained between pupil background and school quality can be misleading when these two sets of exogenous factors are colinear. However, Heyneman and Loxley (1983) found that they were not significantly correlated for most developing countries. This has been confirmed in other studies (for instance, Lockheed, Fuller, & Nyirongo, in press).

²Fuller (1986) and Komenan (1987) deal with school quality trends in more detail. Their work is based largely on data assembled by UNESCO (1986).

³Komenan's (1987) analysis, using a slightly different method, found that per-pupil spending fell by 34% between 1975 and 1984 (in constant 1983 dollars) for the poorest developing countries. Spending for middle-income countries improved somewhat. Expressing expenditures in constant U.S. dollars requires first an inflation adjustment in each country's own currency, then a conversion to dollars using official exchange rates.

⁴Production-function studies have illustrated how the magnitude of achievement effects stemming from alternative school inputs can vary. For example, Jamison (1982) estimated that the achievement gain resulting from the use of radio instruction in Nicaragua also could have been accomplished by lowering class size. But a reduction in class size from 35 to 15 pupils would be required to realize the same gain in pupil achievement.

⁵One classroom observation study done in Nigeria and Thailand revealed that, on average, teachers spent two thirds of their time lecturing at the entire class. When teachers did ask questions of pupils, these utterances, usually requesting a simple factual response, were directed at all students (Anderson, Ryan, & Shapiro, 1987).

References

- Anderson, L., Ryan, D., & Shapiro, B. (1987). *The Classroom Environment Study: Teaching for learning*. (Draft manuscript.) Columbia: University of South Carolina.
- Armitage, J., Batista, J., Harbison, R., Holsinger, D., & Helio, R. (1986). *School quality and achievement in rural Brazil*. Unpublished document. Washington, DC: World Bank.
- Arriagada, A. (1981). *Determinants of sixth grade achievement in Colombia*. Unpublished document. Washington, DC: World Bank.
- Balderston, J., Wilson, A., Freire, M., & Simonen, M. (1981). *Malnourished children of the rural poor*. Boston: Auburn House.
- Behrman, J., & Birdsall, N. (1983). The quality of schooling: Quantity alone may be misleading. *American Economic Review*, 73, 928-946.
- Bibby, J., & Peil, M. (1974). Secondary education in Ghana: Private enterprise and social selection. *Sociology of Education*, 47, 399-418.
- Boissiere, M., Knight, J., & Sabot, R. (1985). Earnings, schooling, ability, and cognitive skills. *American Economic Review*, 75, 1016-1030.
- Cieutat, V., & Pigozzi, M. (1988). *Nepal sector assessment*. Unpublished manuscript. Tallahassee: Florida State University, Learning Systems Institute.
- Eisenmon, T. (1987). *Benefitting from basic education: School expansion and school outcomes in Kenya*. Oxford, England: Pergamon.
- Fuller, B. (1986). Is primary school quality eroding in the Third World? *Comparative Education Review*, 30, 491-507.
- Fuller, B. (1987). What school factors raise achievement in the Third World? *Review of Educational Research*, 57, 255-292.
- Fuller, B., Edwards, J., & Gorman, K. (1986). When does education

- boost economic growth? *Sociology of Education*, 59, 167-181.
- Fuller, B., & Kapakasa, A. (in press). What factors shape teacher quality? Evidence from Malawi. *International Journal of Educational Development*.
- Hartley, M., & Swanson, E. (1984). *Achievement and wastage: An analysis of the retention of basic skills in primary education*. Unpublished manuscript. Washington, DC: World Bank.
- Heyneman, S. (1987). Curriculum economics in secondary education: An emerging crisis in developing countries. *Prospects*, 17(1), 63-74.
- Heyneman, S., & Fagerlind, W. (Eds.) (1988). *University examinations and standardized testing: Principles, experience, and policy options*. Washington, DC: World Bank.
- Heyneman, S., & Jamison, D. (1980). Textbook availability and other determinants of student learning in Uganda. *Comparative Education Review*, 24, 206-220.
- Heyneman, S., Jamison, D., & Montenegro, X. (1983). Textbooks in the Philippines: Evaluation of the pedagogical impact of a nationwide investment. *Educational Evaluation and Policy Analysis*, 6, 139-150.
- Heyneman, S., & Loxley, W. (1983). The effects of primary school quality on academic achievement across twenty-nine high and low income countries. *American Journal of Sociology*, 88, 1162-1194.
- Holloway, S. (in press). Concepts of ability and effort in Japan and the United States. *Review of Educational Research*.
- Jamison, D. (1982). Reduced class size and other alternatives for improving schools. In G. Glass, L. Cahen, M. Smith, & N. Filby, *School class size: Research and policy* (pp. 116-129). Beverly Hills, CA: Sage.
- Jamison, D., Searle, B., Galda, K., & Heyneman, S. (1981). Improving elementary mathematics education in Nicaragua: An experimental study of the impact of textbooks and radio on achievement. *Journal of Educational Psychology*, 73, 556-567.
- Komenan, A. (1987). *World education indicators: Statistical annex*. Unpublished manuscript. Washington, DC: World Bank.
- Lockheed, M., Vail, S., & Fuller, B. (1986). How textbooks affect achievement in developing countries: Evidence from Thailand. *Educational Evaluation and Policy Analysis*, 8, 379-392.
- Lockheed, M., Fuller, B., & Nyirongo, R. (in press). Family effects on student achievement in Thailand and Malawi. *Sociology of Education*.
- Mundangepfufu, M. (1988, March). *School quality in Malawi*. Paper delivered at Ministry of Education/World Bank seminar, Lilongwe, Malawi.
- Peaker, G. (1971). *The Plowden children four years later*. London: National Foundation for Educational Research in England and Wales.
- Psacharopoulos, G., & Loxley, W. (1986). *Diversified secondary education and development*. London: Oxford University Press.
- Ralph, J. (1988). *Planning paper for the Center on the Study of the Education of Disadvantaged Students*. Unpublished manuscript. Washington, DC: U.S. Department of Education.
- Rutter, M. (1983). School effects on pupil progress: Research findings and policy implications. *Child Development*, 54, 1-29.
- Schiefelbein, E., & Farrell, J. (1984). Education and occupational attainment in Chile: The effects of educational quality, attainment, and achievement. *American Journal of Education*, 92, 125-162.
- Simmons, J., & Alexander, L. (1978). The determinants of school achievement in developing countries: A review of the research. *Economic Development and Cultural Change*, 26, 341-357.
- Smyth, J. (1987). *Somalia: Preparation mission report*. Unpublished document. Paris: Office of the Assistant Director-General.
- Thorndike, R. (1974). *Reading comprehension in fifteen countries*. New York: Halstead.
- UNESCO. (1983). *Trends and projections of enrolment by level of education and by age, 1960-2000*. Paris: UNESCO, Office of Statistics.
- UNESCO. (1986). *Education statistical yearbook 1986*. Paris: UNESCO, Office of Statistics.
- World Bank. (1986). *Investing in children: The economics of education*. Washington, DC: Author.
- World Bank. (1987). *World development report*. Washington, DC: Author.
- World Bank. (1988). *The world tables: 1987*. Washington, DC: Author.

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UNIT C

Module 11

Objective(s):

1. To provide a summary and overview of key educational research which can influence improvement in school quality (achievement).
2. To provide a framework for making informed policy decisions for the allocation of learning resources to improve school achievement at the primary level.

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Module Objectives

Education managers, in central government and in schools, face dilemmas about how to allocate resources. This module emphasizes that allocation decisions should be guided by one fundamental question:

Will support of a particular "school input" (teachers, instructional materials, or management) effectively raise "learning output" (pupils' literacy and achievement within the classroom)?

This module covers three major topics:

1. School Quality. A policy-relevant definition of "school quality" is put forward, emphasizing that elements of the local school which raise achievement are valid indicators of "quality".
2. School Inputs. Empirical evidence is reviewed regarding which school inputs and organizational practices improve achievement. This includes identifying specific inputs which have little influence on achievement, and can generate cost-savings.
3. The Relationship Between Policy, Program, and Budget. This segment shows how a technical model for optimizing learning gains must be placed within the context of actual policy and budget debates.

Summary

Education managers face difficult choices over how to allocate scarce budget resources across a variety of school inputs. Should teacher salaries be raised? Will this divert scarce resources away from textbooks, teacher guides, and other instructional materials? As the education budget evolves over time, what relative weight should be placed on improving school quality versus improving school facilities? Where can money be saved through more efficient use of scarce resources?

This module summarizes the existing empirical literature (over 60 studies from around the world) that suggests teachers' inputs and which management practices lead to higher levels of achievement. This includes recent research findings which come from USAID-sponsored projects such as BRIDGES.

Three major findings that have emerged from this research:

1. Teacher allocation and quality make a great difference in determining pupil achievement. Marginal changes, however, do not necessarily lead to higher pupil achievement. Marginal achievement indicators include allocating more teachers to reduce class size, giving teachers marginal salary increases, or lengthening preservice teacher training.
2. Instructional materials that are directly linked to the teaching-learning process consistently raise pupil achievement. These fundamental inputs include textbooks, writing materials, teacher guides, and even the supply of classroom desks. Other symbols of educational quality may influence parents' perception that a local school is of minimal quality, such as minor improvements in school facilities or the purchase of costly science equipment. This body of 60 empirical studies shows that such symbols hold no consistent influence on actual student achievement.
3. Teachers vary greatly in how effectively they use textbooks and basic materials in the classroom. Shifting resources away from ineffective, and toward effective, school inputs is a necessary first step toward raising pupil achievement. Yet simply increasing the availability of inputs, like textbooks, is not sufficient. Improvements in how teachers mobilize instructional materials and organize lessons in more motivating ways are urgently needed. We need to learn more about how teachers actually

teach if future training programs are to yield sustained improvements.

This module reviews the limitations of research from the last two decades. Suggestions for how future research might better inform policy choices and improvements in school management are made.

The module sets this technical knowledge within realistic policy-making arenas. Technical and political issues can be blended to accommodate education constituencies, emphasizing that true gains in school quality will serve a variety of economic and social interests.

Finally, this module emphasizes that empirical evidence can aid central government's policy choices. Module 13 focuses on school-level management. Once policy-makers have decided how to allocate scarce resources for effective school inputs, a variety of implementation problems must be addressed. Module 15 focuses on implementation issues that arise as inputs move from the Ministry down to local schools.

Defining "School Quality"

Elements of higher "school quality" include teacher characteristics, pedagogical practices, instructional materials, and forms of school management. These elements of school quality are empirically related to higher pupil achievement.

This definition emphasizes facets of the school that consistently raise levels of acquired literacy, after controlling for the prior influence of pupils' family background. Judging a school's quality by the capacities of its students before they enter the school is not valid, nor can we evaluate the quality of a particular school based on the performance of its students. To grasp the value added by the school, the increase in knowledge and skills contributed by attendance at school, we must examine the institution's effects, minus the prior influence of family background. Then, we can identify those specific elements of the school that help raise pupil achievement.

Elements of the school, such as a neatly painted classroom, which are not empirically related to higher achievement should not be considered elements of school quality. Such school characteristics, which may be seen by parents as signals of better educational quality, may attract more children to the school.

This definition requires education policy budget-makers to identify those school inputs and management strategies that boost achievement. This guides the allocation of scarce resources to those school quality factors that make a difference.

Research Findings: What Policies and Investments Raise Pupil Achievement?

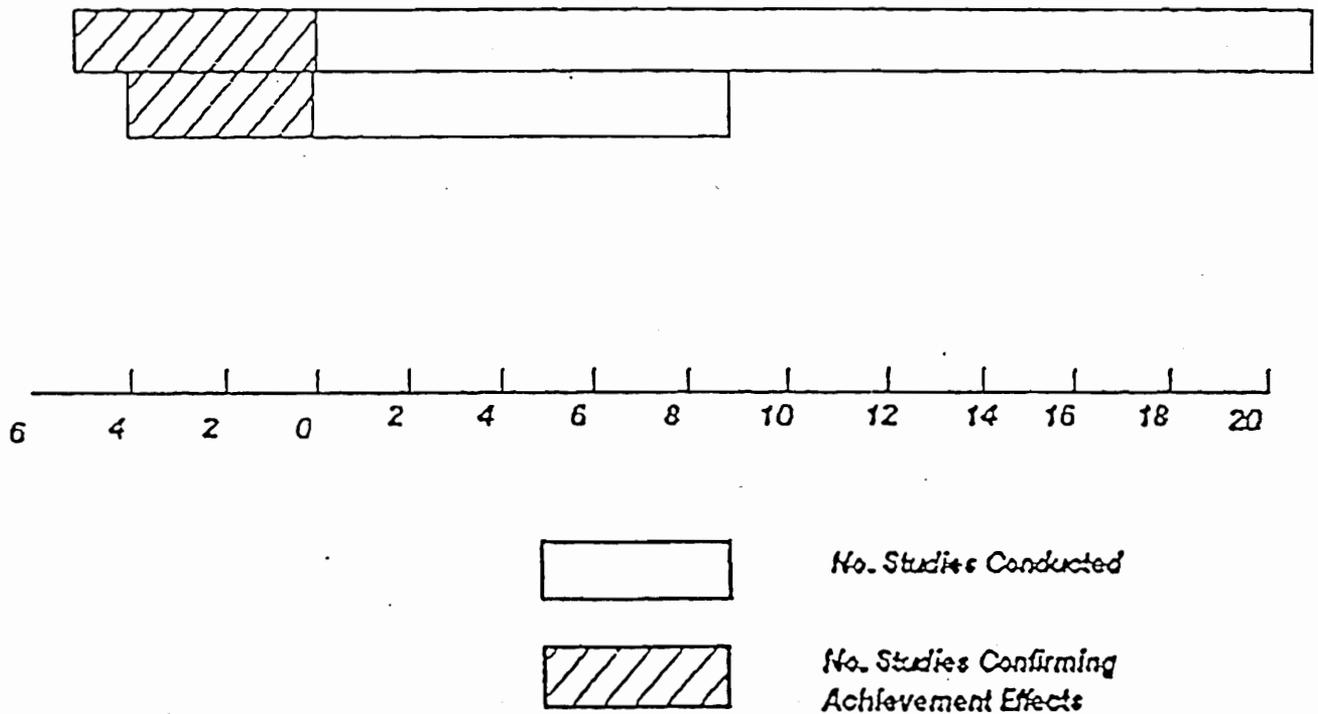
Teachers/Allocation and Class Size. International agencies and governments commonly claim that reducing class size will improve school quality. In some settings, such as sub-Saharan Africa or parts of South Asia, class sizes that exceed 50 or 60 pupils are likely to constrain levels of achievement. In countries or regions where class size averages 30 to 40 pupils, will incremental reductions raise pupil achievement? Based on over 20 carefully conducted empirical studies, the answer is no. Considering the high costs associated with hiring additional teachers to reduce the average class size, this policy option should be considered very carefully. More efficient deployment of teachers is often a more cost-effective solution. For example, some countries have redeployed teachers from rural schools with small classes to overcrowded urban schools with no increase in government's wage bill.

Let us now look at the empirical findings (see Figure 1, page 5). In Figure 1, the longer horizontal bar at the top indicates that 21 studies have looked at the question of whether pupils in smaller classes achieve at higher levels. These studies have controlled for a variety of other school factors and pupils' social class background.¹ The darker color bar indicates the number of studies that found significant evidence of this hypothesized effect. In five of the 21 studies conducted, pupil achievement was found to be significantly higher. Recent USAID-funded research in both Pakistan and Thailand confirms that significant achievement differences are rarely observed in schools with smaller classes.

¹The over 60 studies included in this review include only those that employed a multivariate or experimental design. This ensured that any findings regarding the influence of specific school factors occurred after the prior influence of pupil background was partialled out. A "significant relationship" between a school factor and student achievement means that the measure of association (in regression studies) or group difference (in experimental studies) was statistically significant (for technical details see, Fuller 1985).

Figure 1

STUDIES OF CLASS SIZE, SCHOOL SIZE
& PUPIL ACHIEVEMENT EFFECTS



Some policy-makers argue that larger schools tend to possess higher quality, so a minimum number of teachers should be assigned to each school. However, the empirical findings do not support this claim. Only four of the nine studies conducted show that pupils within larger schools achieve at higher levels.

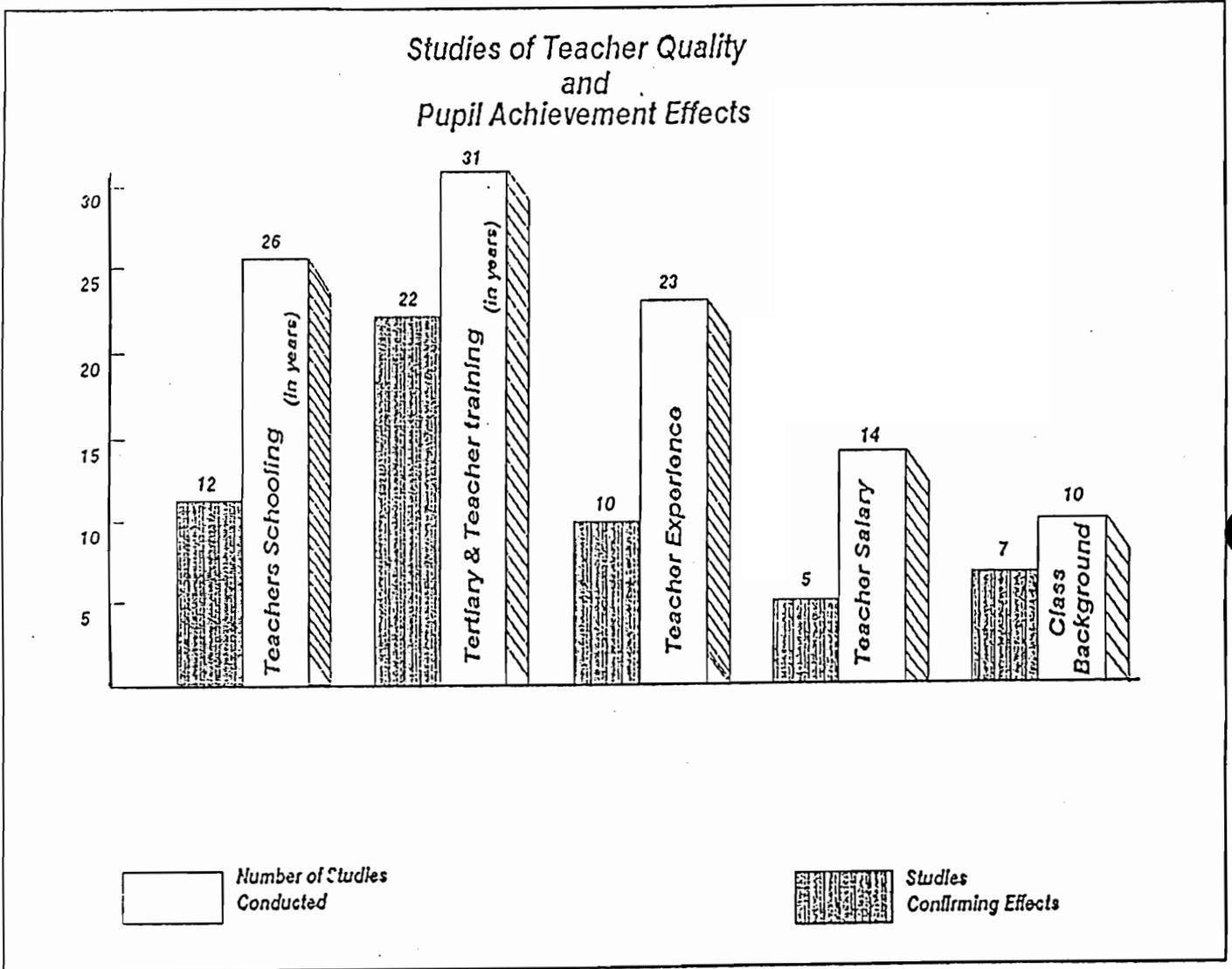
Teachers/Background and Training. The selection of new teachers based on their potential teaching abilities is very difficult. Real selection of new teachers occurs with admission into teacher training colleges, before these students have even tried to teach. So, teacher selection is based on indicators that presumably are related to future pedagogical proficiency such as secondary school credentials or performance on the national exam. Governments in the Third World assume that longer preservice teacher training raises the young teacher's effectiveness. Are these assumptions backed by empirical evidence?

Figure 2 (see Figure 2, page 7) summarizes findings from studies that examine whether indicators of "teacher quality" are, in fact, related to higher levels of pupil achievement. The top bar in Figure 2 shows that 26 studies have been conducted which correlated the teacher's years of schooling with the achievement levels of the same teachers' pupils. Just 12 of these studies found a significant relationship between years of training and student achievement, controlling for the influence of pupil background and other school factors.

In contrast, two-thirds of the 32 studies that have looked at the length of post-secondary and teacher training have found higher levels of pupil achievement (second bar from the top in Figure 2). Note that the high cost of preservice teacher training, relative to improving potential teachers' secondary schooling, should be considered. That is, the achievement effect of potential teachers may be realized in a less costly way by raising the quality of secondary schools.

In Figure 2 we also see that teachers with more experience are not necessarily more effective in raising pupil achievement. Differences in teacher salaries levels (within particular countries) are not related to levels of pupil achievement. This may be due to the fact that younger, lower paid teachers often are better trained and more effective in the classroom. Finally, teachers from higher social class backgrounds tend to be more successful in boosting pupil achievement. However, the equity effects of recruiting new teachers from certain social groups must be taken into account.

Figure 2



Classroom Organization and Teaching Practices. Less research has focused on teaching practices and how learning is organized within the classroom (see Figure 3, page 9). In Figure 3, we see that the length of the instructional program does consistently raise achievement levels, controlling for the influence of other factors. The amount of time that teachers reportedly spend in preparing lessons is also related to higher pupil achievement. The frequency with which homework is assigned appears to yield positive achievement effects, although the number of studies is small.

A new generation of classroom studies has recently emerged from the Third World. This line of inquiry, supported by USAID and the IEA, is providing a more contextual understanding of what teachers do in the classroom. These studies describe how teachers utilize instructional materials, and how teachers interact with children to motivate higher achievement.²

Basic Instructional Materials. Much research has examined how variation in the supply of certain instructional materials influences pupil achievement. Figure 4 (see Figure 4, page 10) summarizes the outcome of these studies. For example, 16 out of 24 carefully conducted studies have found that the supply of textbooks and other reading materials is related to higher pupil achievement (top bar).

Fifteen out of 18 studies conducted show that the presence of a library of reading materials is related to higher pupil literacy. Pupils' nutritional level or the presence of a school feeding program is also related to higher achievement levels. In contrast, pupils attending schools with science equipment or laboratories rarely do better than pupils in schools without these materials.

A handful of studies has examined the influence of radio instruction on pupil achievement. These evaluations consistently show that radio instruction has strong effects on students' acquired literacy (bottom bar of Figure 4).

²The International Association for the Evaluation of Educational Achievement recently sponsored classroom observation studies in Nigeria, Thailand, and South Korea (see Lorin Anderson's study in the reading list).

Figure 3

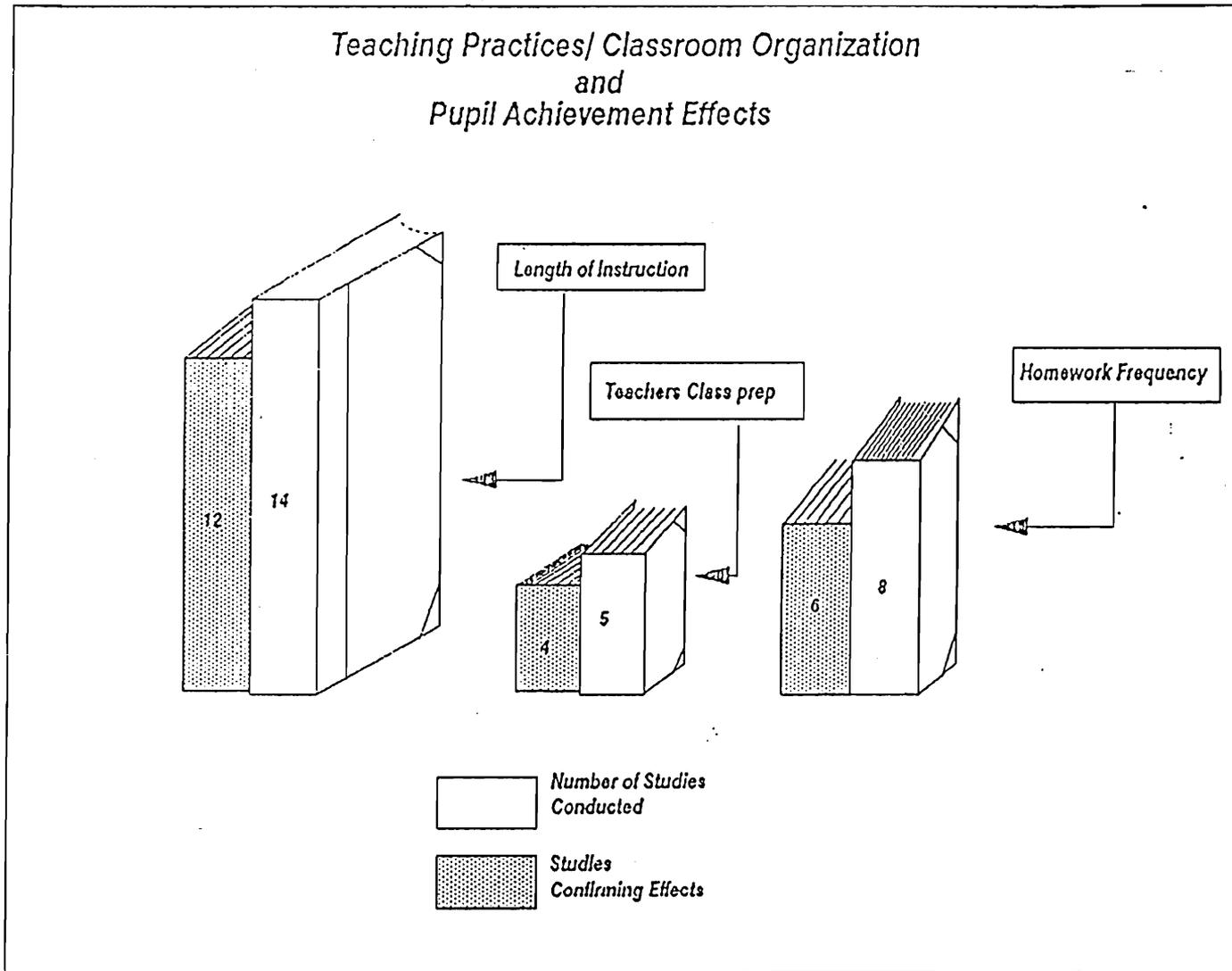
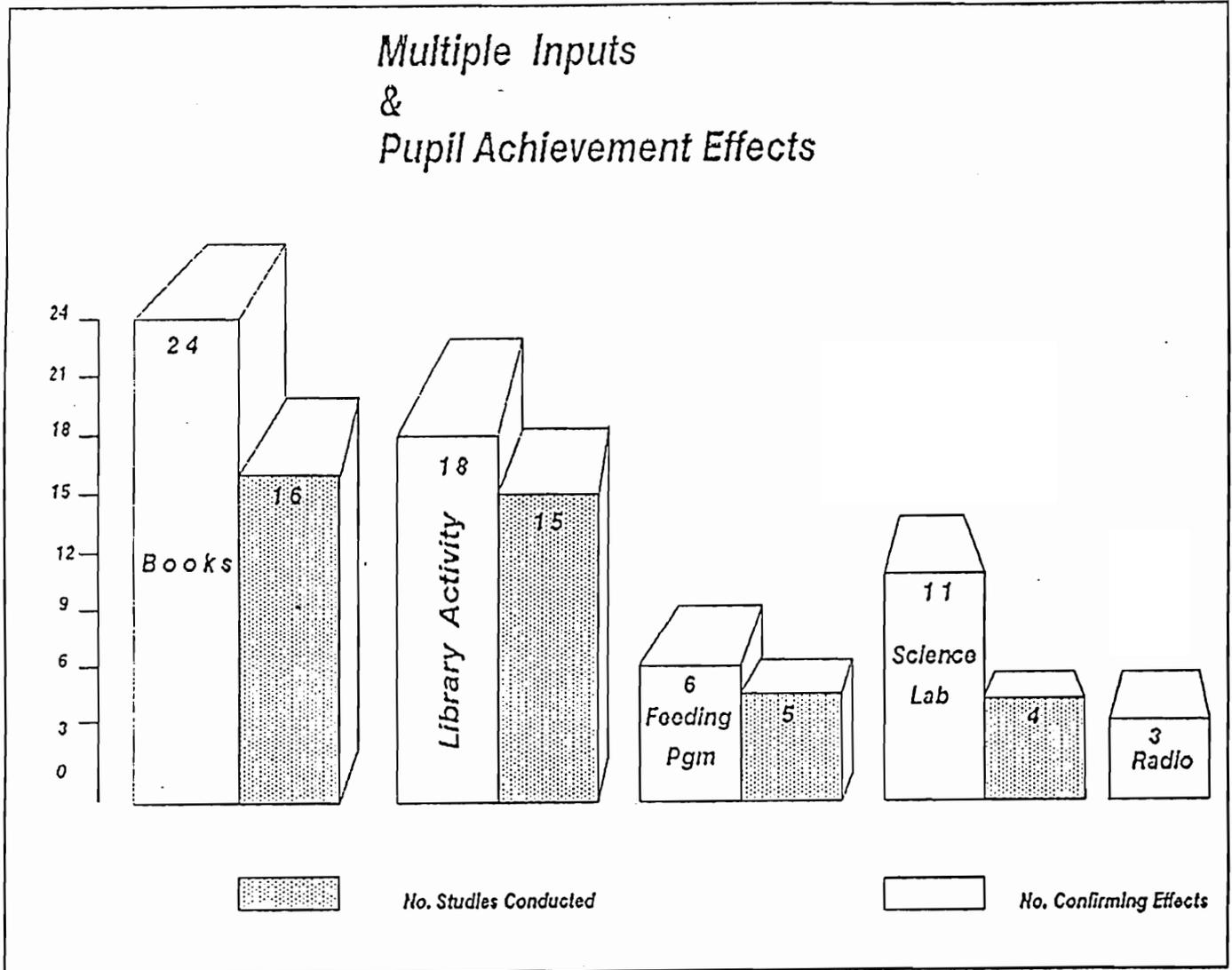


Figure 4



Current Research/Building Knowledge on Teaching and the School Organization

USAID is attempting to build upon the existing knowledge base of research in two ways. First, these 60 original studies provide working hypotheses and questions regarding which school qualities influence pupil achievement. The intent is to do follow-up studies within specific nations and even particular regions within a country. Second, the current generation of research attempts to move beyond the limitations of these original studies, which were conducted over the 1970-1985 period.

USAID has recently supported collaborative research on determinants of pupil achievement in Africa (Botswana, Burundi, Kenya, Lesotho, Liberia, Malawi), Asia (Indonesia, Pakistan, Thailand), and Latin America (Colombia, Guatemala, Haiti). This work is advancing our knowledge of how to boost children's achievement on several fronts:

1. Pupil achievement effects stemming from basic instructional materials are greatest in regions with the most impoverished schools and populations. Increasing the supply of textbooks or lowering class size in well-endowed schools may yield insignificant achievement gains. Thus, the present distribution of school inputs and teacher quality should be taken into account as investment decisions are being made.
2. How different teachers organize lessons, manage class time, and utilize basic instructional materials varies greatly across classrooms. The economists' production metaphor has dominated the past 20 years as research efforts tried to model the determinants of pupil achievement. But, labor-intensive production processes involve human action, be it subsistence farming, managing a modern firm, or teaching. Recent research, sponsored by USAID in Botswana, Colombia, Pakistan, and Thailand, focuses on how teachers organize lessons and utilize instructional materials. Two surprising results deserve to be highlighted. Even in schools that have sufficient supplies of textbooks and writing materials, teachers vary in the extent to which they employ these essential learning resources. In addition, teaching practices that are empirically related to high achievement are not necessarily demonstrated by teachers with more years of schooling or longer preservice training. Over the next few years, this new line of research will further identify effective teaching practices and how training programs can better improve pedagogy.

3. Headmasters play an influential role in raising teachers' motivation and competence. Strong headmasters also can boost community support, increase the supply and utilization of textbooks, and basic materials. The influence of teachers and instructional resources on pupil achievement is mediated by the motivating actions of headmasters. A good headmaster can raise his or her teachers' perception of efficacy. The headmaster can make teachers feel that their efforts in the classroom make a difference in raising children's literacy (see Module 13).
4. The cost of alternative school inputs must be taken into account. As we learn more about which teacher qualities, instructional inputs, and school management strategies effectively raise achievement, the next step is to identify the relative cost-effectiveness of these alternatives. Very few studies have factored in the cost element. Initial studies show that textbooks and the use of radio instruction are highly cost-effective. Allocating more teachers to lower class size, even when slight achievement gains can be observed, is always costly and usually ill advised.
5. Instruction to young children should be in their local language.

Very little research has been conducted that defines "pupil achievement" in broader ways beyond simple measures of literacy and numeracy. Many countries attempt to teach a variety of subjects, including topics pertaining to political socialization, moral values, or religious education. These non-secular forms of learning should be assessed more carefully in the future.

Research Findings versus Institutional Realities

Many of these research findings are well known to ministry planning officers, Third World scholars, and international agency advisors. Sometimes this technical knowledge is passed on to education ministers and other government leaders. The World Bank and other donors frequently publish policy advice and research reports which are read by educators and government leaders in developing countries. **So why is it that the framing of policy and budget choices rarely takes into account empirical evidence?**

Answer 1:

Empirical evidence is different from political reality. Educational quality can be signaled in ways which are unrelated to actual gains in pupil achievement. An education ministry may believe that raising preservice teacher training requirements, buying school laboratory equipment, or building student boarding facilities will increase pupil achievement. Even if these symbols of quality do not boost achievement, they concretely signal government's symbolic commitment to quality education. Similarly, the hiring of additional teachers serves a variety of important political agendas, for example, raising employment.

Answer 2:

Educational expansion is a higher priority than improving school quality. In countries where primary school enrollment or pupil persistence rates remain low, the task of building more classrooms and training more teachers seems most pressing. Efforts to improve school quality, while many children are not even attending school, may seem inequitable. Even for children who attend school for several years, improvements in school quality must receive a higher priority.

Answer 3:

We want to improve quality, but the research findings are not valid for every country or educational system. Unfortunately, this growing body of evidence can only provide guidance and working hypotheses to stimulate and inform a broader policy dialogue. Ideally, empirical relationships should be tested in each particular country. Critics of this research correctly point out that many findings come from work done in Latin America and East Asia. More research is needed to test these working hypotheses in sub-Saharan Africa and South Asia. Yet recent research in these two regions generally confirms the basic findings described above.

Answer 4:

Discretionary resources to support effective school inputs are difficult to make available. The bulk of sector resources supports salaries for teachers and school administrators. Finding discretionary resources for textbooks or inputs that consistently boost pupil achievement is a problematic task, technically and politically. Most budgetary change occurs at the margin. One strategy which low-income countries have successfully carried out is to move budget resources previously linked to inflation increases away from ineffective inputs and toward more cost-effective school inputs.

Supplementary Readings

- Anderson, Lorin and others (1989). The IEA Classroom Environment Study. Oxford: Pergamon.
- Eisemon, Thomas and others (1989). "Empirical Results and Conventional Wisdom: Strategies for Increasing School Effectiveness in Burundi." Cambridge, Mass.: Harvard BRIDGES Project.
- Fuller, Bruce (1985). Improving School Quality: What Investments Boost Learning? Washington, D.C.: World Bank.
- Fuller, Bruce and Stephen Heyneman (1989). "Third World School Quality: Current Collapse, Future Potential," Educational Researcher, vol. 18, pages 12-19.
- Lockheed, Marlaine, Adriaan Verspoor and others (1990). Improving the Quality of Primary Education in Developing Countries. Washington: World Bank.
- Montero-Sieburth, Martha (1989). Classroom Management: Instructional Strategies and the Allocation of Learning Resources. Cambridge, Mass.: Harvard BRIDGES Research Report 4.
- Pitiyanuwat, S. and others (1986). Evaluation Report of the Project to Improve the Efficiency of Primary School Teaching. Bangkok: Office of the National Primary Education Commission.
- Raudenbush, Stephen and Chinnapat Bhumirat (1990). "The Distribution of Resources for Primary Education and Consequences for Educational Achievement in Thailand," International Journal of Educational Research.
- Wheeler, Christopher and others (1989). Policy Initiatives to Improve Primary School Quality in Thailand. Cambridge, Mass.: Harvard BRIDGES Research Report 5.

**“Classroom Management:
Instructional Strategies and
the Allocation of Learning
Resources”**

Martha Montero-Sieburth

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Special thanks to Armando Loera-Varela for his work on instructional time.

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Foreword

This paper provides a framework for the design and evaluation of policies intended to improve learning outcomes of schools. Montero-Sieburth argues that three major factors contribute to the amount of learning in schools:

- 1) the effective use of instructional materials,
- 2) the quality of academic activities and tasks, and
- 3) the amount of academic time spent on engaging students in learning.

Her paper focuses on policies that affect the first and third factors, use of instructional materials and the allocation and maintenance of "time on academic task."

The simplicity of this framework may mislead those who are accustomed to thinking of the educational process as tremendously complex, so much so that they resist attempts to make teaching "scientific" and instead proclaim it an "art form." It may challenge those who believe that reduction of education to a mere process of instruction takes the soul out of the educational endeavor, leaving only an empty shell of technique.

Montero-Sieburth's contribution, while simple, is not simplistic. It expands the creative role of teachers rather than minimizing it. Not only must teachers be innovative in implementation of the curriculum in response to variations in students, they must also be innovative in the development of instructional aids out of whatever materials the environment provides. Montero-Sieburth shifts the definition of teachers from "implementors of a centrally designed curriculum" to "classroom managers of a variety of resources," only some of which are provided by the administration. **The teacher remains the major source of students' learning of values, skills, and knowledge.** The question is, what can central ministries do to help teachers be more effective, given the resources that are already present in the system?

Improvement in the quality of instruction will come principally through curricular reforms (of the kind described in Thiagarajan and Pasigna, BRIDGES Research Report Series No. 2, 1988), and

through improved pre-service and in-service training programs—but ministries can do much to increase effectiveness through policies that affect the academic time spent on the teaching-learning process.

In many education systems both curriculum and pedagogy are largely unimplemented, because neither teachers nor students spend enough time on teaching and learning. Nor are they aware of how time is used or wasted. Assumptions by the ministry about what will take place in classrooms are invalidated, as too little time is employed in the realization of pedagogic goals, and knowledge about classroom interactions is unknown. Systems fail to reach objectives not so much because the curriculum is bad, but because it is not fully used or relevant, and not so

The teacher remains the major source of students' learning of values, skills, and knowledge.



much because teaching is poor, but because there is not enough of it. This paper provides evidence to support the conclusion that policymakers seeking fairly prompt improvements in levels of teaching-learning should attend to increasing the already available time spent on academic tasks for teaching and learning.

The key elements in the framework for consideration of policy options are the teacher, students, and the resources available to the teacher. For each, time is the underlying dimension. Teacher time-on-task can be increased by reduction of absenteeism, reduction of time on non-academic activities at school, and a corresponding increase of time spent teaching the formal curriculum. Student time-on-academic tasks can be increased by relevant instructional materials, more frequent examinations, assignment of home-

work, and parent involvement in the instructional endeavor. Time-on-task can also be increased through use of materials (textbooks, workbooks) that permit students to focus on the curriculum even when they are not being taught by the teacher.

Montero-Sieburth reviews available research, but it is evident that an even broader range of options exists both for policymakers and creative teachers.

The contribution of this paper to a dialogue on policy options for the improvement of learning outcomes is its identification of the importance of the teacher in carrying out academic tasks while maintaining order through stable classroom organization.

Noel McGinn
April 11, 1989

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Executive Summary

Because of present limited resources in developing countries, finding the most effective means to achieve educational goals demands finding alternatives with the lowest possible costs. This requires knowing how to best use the already available resources within the education system.

Classroom management attempts to use the human and material resources already present to improve the quality, as well as the quantity, of learning through time-on-task. This review deals with the relevance of classroom management to developing countries by emphasizing teaching in relation to management, and by the use of instructional materials and time as teacher-managed activities and strategies that lead to learning.

Generalizations from the review include the following:

- In order for learning to take place, stable teacher and student attendance patterns in developing country schools must exist. Teachers need participation incentives (where they are lacking) such as



...the idea that teachers can be managers requires a basic change in the concept of teachers as passive agents of the educational system.

recognized status, professionalization, and merit considerations. Students need recognition, knowledge and skill development, and goal achievement.

- A different perception of teachers and teaching, one directed at training teachers in more effective and efficient use of existing resources, needs to be adopted.

- Policymakers, local school administrators, and/or teachers can initiate changes, but it is the teacher as a classroom manager who has the greatest influence on learning. Acceptance of the idea that teachers can be managers and active decision makers, requires a basic change in the concept of teachers as passive agents of the educational system.

- Teachers deal with a series of complex situations in everyday teaching — instruction, management, socialization, and discipline. With classroom management, teachers can control their students' behavior and learning through appropriate use of procedural strategies.

- The available resources to teachers in classrooms are time and instructional materials. However, the utilization of such resources depends on the teacher's ability to organize, pace, sequence, monitor, and provide feedback to students.

- Time spent on academic tasks yields learning outcomes, so time as a resource needs to be considered in light of time that is wasted. However, the quality of the task and student engagement are even more significant.

- The textbook is the most significant instructional material in developing nations. Its cost and production, however, make other learning options appealing.

- Instructional materials in themselves do not guarantee learning. Instead it is the way in which these materials are used that contributes to learning. Instructional materials are relevant in proportion to the students' and teachers' ability to use and interact with them.

The final section of this paper suggests recommendations to policymakers.

Section I: Introduction

Purpose of Review

Those concerned with improving educational outcomes, but confronted by an under-financed education system, have three options:

- to use existing resources more effectively,
- to seek additional resources, or
- to reduce the number of children served.

The purpose of this paper is to suggest policy options for the more effective use of existing resources through improved management. The struggle for increased funding, especially for basic education, must continue but available resources can be employed in more effective ways.

The recommendations of the paper are for policy changes, but because the work of education takes place in classrooms, it is changes in classroom management practices that will have the greatest effect. The paper will (1) define classroom management; (2) clarify the application of classroom management to developing country contexts; (3) identify those variables that, while directly controlled by teachers, can be influenced by government policies, namely, utilization of instructional materials, including the use of textbooks, and the use of classroom time; and (4) address the potential of classroom management for developing policies directed at teacher education, textbook production, opportunities to learn within classrooms, and reduction of teacher and student absenteeism.

Significant Variables

Although this review discusses the effects of classroom management on school policies, it does not address issues of school organization, such as leadership of the principal, school administration, and community-school interface. (These issues will be addressed in another BRIDGES Research Report, "Recognizing, Fostering, and Modeling the Effectiveness of Schools as Organizations in Third World Countries" by John Schwille et al.) This review analyzes the classroom within the formal school setting.

In the following sections, the paper defines classroom management in terms of instructional and management strategies, and provides as an illustration a Latin American composite case study of rural and urban classrooms. The paper then reviews research on how the policy variables of instructional time and materials affect learning outcomes. Policy implications and recommendations for future policy initiatives are discussed in the concluding section.

The recommendations of the paper are for policy changes, but because the work of education takes place in classrooms, it is changes in classroom management practices that will have the greatest effect.



Section II: Definition of Classroom Management

Classroom management as understood in the industrialized countries refers to "the provisions and procedures necessary to establish and maintain an environment in which instruction and learning can occur" (Duke, 1979: xii). According to Doyle (1986: 395), "...classroom teaching has two major task structures organized around the problems of learning and order. Learning is served by the instructional function (directed at individual cognitive engagement with academic content)...and order is served by the managerial function" directed at group participation. Brophy (1988:3) goes on to state that classroom management and instructional activities are simultaneous and inseparable: some minimal level of orderliness is essential for instruction to take place; at the same time, lessons must be designed to engage students' attention. Thus, classroom management entails not only teacher regulation of students' behavior through the establishment of rules and procedures and disciplinary interventions, but also the use of instructional strategies such as lecturing, questioning, recitation, seatwork, grouping, and the use of instructional materials to engage students in academic tasks. In short, classroom management is closely affiliated with teaching and classroom discourse (Brophy, 1988; Doyle, 1986).

Classroom management encompasses instruction ("actions assisting student in mastering formal curriculum"), student socialization ("actions intended to influence students' beliefs, attitudes, personal and social behaviors, expectations"), and disciplinary interventions ("actions intended to change disruptive behavior of students") (Brophy, 1988).



Teaching and management are the intervening factors between policy initiatives and educational outcomes.

Thus a good teacher is described as:

a thoughtful practitioner who operates with considerable autonomy, yet purposefully works toward a set of goals that are simultaneously differentiated and integrated (Porter & Brophy, 1988:81).

Any attempt at utilizing classroom management strategies in developing countries needs to take into account the following caveats:

1) The nature of classroom management—which is linked to effective teaching, teacher thinking, and classroom discourse (Doyle, 1986)—in industrialized countries should not be translated as a set of techniques or a new technology separate from the control of the teacher in developing countries. It is most likely that approximations of classroom management are already in place in some developing countries through instructional delivery, uses of instruction, and direct and active teaching. Thus understanding that classroom management principles may not have a one-to-one correspondence in their application, but may be found in "approximations" to its practice, is important.

2) Evidence of the impact of classroom management in cross-cultural settings is yet unknown, although Brophy (1987:7) asserts "that there is no evidence that different classroom management principles apply to different racial or ethnic groups..." and that familiarity with the local languages and customs may enable teachers to respond more effectively to their students. Therefore classroom management practices will need to be experimented with in different contexts—rural, urban, semi-rural and urban-marginal—and the cultural norms and values of a country will have to be considered.

3) The fundamental premise of classroom management is that the teachers' role is to maintain student engagement in academic endeavors rather than to focus on student distractions and discipline. However, such emphasis on disciplinary interventions will need to be considered within the context of developing countries. But insuring that students and teachers get to school and have instructional materials to work with may be more important than discipline issues.

4) The different attributes of classroom contexts such as multi-age groupings, large class sizes, maturity levels of students, available school facilities, the nature of urban and rural schools, and teacher expectations and attitudes, may present teaching/managing challenges of different magnitude in developing countries as compared to industrialized countries.

5) Finally, understanding the complexity of teaching and considering the importance of teachers as resources and managers within classrooms will require a different conceptualization of the teacher and his/her profession in developing countries.

For the purpose of this paper then, "classroom management" refers to teaching and management together. Teaching, understood as instructional strategies, and management, understood as patterns of use of instructional resources, are the dual concepts that explain how educational goals can be achieved through classroom practices. Teaching and management are the intervening factors between policy initiatives and educational outcomes. For example, the effects of policies with respect to production of materials and selection and training of teachers are mediated, or realized, through the instructional strategies and classroom management practices of teachers. Policymakers can make a better selection among options that affect teachers by understanding how classroom management practices affect learning outcomes, and how those practices are in turn influenced by central policies.



Each of these factors can be weighted differently, depending on context.

Applicability of the Concept of Classroom Management to Developing Countries

Educational efforts in the developing world have traditionally focused on issues of access, teacher availability, school facilities, and instructional materials—the quantitative allocation of resources. The prevailing rationale has been that once most students are in classrooms, and the teacher is present, then the basic conditions for schooling and learning are present. Acting on this premise, educational

policymakers usually focus first on issues of availability of resources and access and later on issues of quality. Allocation of resources alone without regard to the teaching process, however, does not guarantee learning. Rather, it is both the quantity and quality of the interaction between teachers and students that are relevant (Calderhead, 1984; Doyle, 1986).

Given limited resources, the best policy options are those that produce the same outcomes, but at lower cost, or that increase outcomes at no additional cost. Changes in classroom management practices are one way to do this. Educational quality then can be viewed as a function of:

...(a) the level of material inputs allocated to school per pupil (resource concentration), and (b) the level of efficiency with which a fixed amount of material inputs are organized and managed to raise pupil achievement (Fuller, 1985:23).

Fuller cautions that it is not the aggregated sum of various material inputs that accounts for levels of quality—more is not necessarily better—but the management capacity of teachers or how well they use resources in the classroom. Mere allocation of material inputs is, therefore, not enough. More innovative ways of understanding how schools work and how quality can be improved are the issues (Fuller, 1986:63). For example, although some gains in learning will result just from giving textbooks to children, learning gains can be increased much more if teachers organize students' use of the books.

To understand how to improve management capacity it is important to identify factors that are directly related to quality of education, particularly to classroom management. These factors include teacher background (including issues such as pre- and in-service training and teacher behaviors related directly to achievement), efficient use of instructional time, assessment of student performance, and use of instructional materials (Fuller, 1985:24).

While policymakers or school principals can initiate changes in the educational structure, the curriculum, and administration, it is teachers who are expected to have the greatest impact on learning. Acceptance of the idea of teachers as decision makers and managers requires a basic change in the notion of teachers as passive agents of the education system. As a result, the change in concept has policy implications: policymakers should take appropriate measures to enhance the management capability of teachers in order to improve educational outcomes.

Classrooms as Contexts

Teaching takes place in the classroom, a complex site where what happens is a function not only of the physical setting but also of the human participants, and their behaviors toward each other. Erickson and Shultz (1977) consider that:

Contexts are not simply given in the physical setting... nor in combination of personnel (two brothers, husband and wife, fireman). Rather, contexts are constituted by what people are doing and where and when they are doing it. As McDermott (1976) puts it succinctly, "people in interaction become environments for each other."

Classrooms vary in terms of student/teacher ratios, age ranges, levels of attrition, retention and repetition rates, provision of basic instructional materials and, in some cases, community support for schooling (Wells, 1976). The national curriculum cannot anticipate the different circumstances in which teachers must implement it. Furthermore, education systems with severe resource constraints spend most (often over 90%) of the annual budget on salaries, leaving little for material inputs. A teacher's capabilities to manage and direct learning activities under these conditions are critical.

Classrooms are defined by their location (rural, urban, semi-rural, and urban-marginal), size, number of students, region, grade distribution, resources, language of instruction (first or second language), numbers of teachers, and other criteria. Classrooms vary widely, from those developed by the community on an available plot of land, to those supported through local initiatives, and those receiving funding and materials from the government. In many countries, multigraded classrooms with one teacher for up to six grades are not unusual. Several common elements can be identified from observations made in rural and urban classrooms in Costa Rica (Brenes et al., 1987; Montero-Sieburth, 1983, 1986, 1987), Guatemala (Montero-Sieburth & Loera-Varela, 1986), Latin America (Arancibia, et al., 1986; Avalos, 1985; Munoz Izquierdo, et al., 1979; Moore, 1983) and Thailand (Classroom Environment Study Report, 1985). Understanding the context in which teachers work is essential for the identification of those classroom management practices that could be most effective in terms of learning outcomes. To facilitate the discussion in the rest of the paper, the following section is a composite description, based on

repeated observations, of a "typical" classroom in Latin America.

Latin American Composite Description Physical Layout

The classroom is situated in a large building with a physical layout that allows for benches to be placed across the room. Where there are no benches, chairs are brought in by students from their homes, or desks are provided. Sometimes there are so many desks or benches that students have to walk across them in order to reach the blackboard. The teacher's desk is to one side or at the front of the room; there are sometimes blackboards on one wall, and usually a cabinet with a lock. Bookshelves are scarce. Lighting is frequently provided by only one large window, since the other windows have been covered to avoid distractions. Hanging light wires or sockets without light bulbs are common. Depending on the vicinity, the classroom is either carpeted from wall to wall with students, or, in more rural areas, a scattering of students will be grouped in the center of the room with whatever available facilities there are. The blackboard shines since it has been painted over or had "milk" applied to give it a smooth surface for the chalk to move upon. Materials are scarce, especially chalk and pencils. Toilet paper is at such a premium it is kept by the teacher or is locked in a drawer and students have to ask for it when going to the bathroom. In some schools, toilet paper is nonexistent, unless provided by parents' groups or teachers.

Intersection of Instructional Delivery, Time, and Context with Behaviors

In general, the teacher's class delivery occurs in the following order. A roll call is taken by the teacher while students are asked to take out notebooks or textbooks from the locked cabinet. In some cases, the teacher hands out materials or has a few students distribute books. These activities alone take up 15% of the allocated class time. For the next 70% of the class time, the teacher presents information through lectures, asks questions, asks for recitation, dictates, writes notes on the board if chalk is available, checks homework either by moving around from seat to seat, or by having students line up and present their work individually, and monitors seatwork. During the

question and answer routines, the teacher directs questions to the entire class and often expects a choral response. Questions are answered by the teacher when there is no response. Feedback on individual progress is infrequent and arbitrarily given; students' efforts do not often get the teacher's open recognition (verbal praise or acknowledgement). Much of the instruction is teacher-centered, with limited opportunity for students to be involved in experiments or to demonstrate their understanding of concepts. Much time is spent with teachers dictating or writing the homework assignments on the chalkboard, while students copy them down. Students use the blackboard for drills, homework exercises, or exemplification of answers to subject matter problems.

About one-third of this time is spent on discipline, transitions between learning activities, or organizing sports and other non-academic activities, such as celebrations, festivities, etc., interruptions from school administration, from visiting parents, from students asking for permission to go to the bathroom, and on occasion from vendors selling their wares to teachers. Teachers discipline students either openly within the group or by taking students aside to reprimand them. Punishment may take the form of seating changes or segregating students in one corner of the classroom.

The teacher's engagement in activities does not mean that all students are also engaged in learning. In some instances, as the teacher sits down to grade notebooks with students clustering around him or her, the rest of the class may be reading silently, drawing, or talking with each other. Engagement may be social, rather than academic. In some instances, class time is broken up by the school lunch or breakfast which is prepared and eaten during recess. In Guatemala, a high protein drink called *incaparina* is served during recess at about 10:30 a.m. It serves to sustain the students until the end of the school day at noon.

In other instances, time for teaching subject matter per week is allocated by guidelines from the central educational office, and the teacher organizes her/his time accordingly. In most cases, the teacher controls the subject matter preference. In general, language arts, mathematics, and in some cases, religion are more frequently

taught than science or social studies. For the remaining 15% of the available time, the teacher will dictate new information, write the homework assignments and exercises on the blackboard to reinforce the lessons, or organize non-academic activities in preparation for celebrations or sports activities. The social dimensions of community life intersect with schooling to the degree that preparation for celebrations or sports may consume much of the academic learning time available, significantly reducing the actual total of school attendance days.

Instructional materials, including pencils, blackboards, and paper, are limited; those available are usually controlled by the teacher. In some cases, the materials are provided by the central education office or local parents' group; in others, textbooks are commercially produced, bought by families with means, and used as a guide by the teacher. Where textbooks are scarce, they are shared in groups of twos, threes or fours. The teacher's book is sometimes the only instructional material. The use of real-life objects such as vegetables and plants for instruction is common. Textbooks are collected either by one student or brought by individual students to the teacher for storage after the lesson is over. At the end of the school day, students leave with their notebooks and complete the remaining homework assignments.

This composite description of a "typical" classroom suggests that although the presence of instructional materials is important, how they are used is the more critical question. The resources used within classrooms, their cultural relevance, and the creativity of the teacher are not always considered. How teachers and students spend their time in the classroom, how they use materials, how they interact with each other, would seem to be the critical determinants of learning. We turn now to research on use of time.

Section III: Factors That Limit Amount of Time Available

Time as a resource is finite; there is only so much of it. The total amount of time available to teachers for instruction, and to students for learning in the classroom, is limited or constrained by the presence of teachers and students in the classroom. This section reviews research on teacher and student absenteeism, and suggests policy options to reduce both, thereby increasing the total amount of time each is present in school.

Teacher Availability and Absenteeism

Not only is there a severe shortage of (qualified) persons willing to teach in rural areas (Dworkin, 1980; Marsh, 1984), but there are also high rates of



Time as a resource is finite; there is only so much of it.

teacher absenteeism. In the countryside, the loss of a teacher often means the closing of a school. Absenteeism is defined as long term absence by a teacher, or chronic, short term absences where no substitute teachers are available. Teacher turnover, the departure of teachers from school in order to leave the teaching assignment or the teaching profession, is considered here as a special aspect of teacher availability.

Research reports and statistics on teacher availability in developing countries are scanty. Systematic research on teacher attendance is limited. The World Bank, for example, in a report on sub-Saharan African education describes the following:

In rural areas, classes of 80 or more pupils are not uncommon. These classes may be held in dilapidated structures, frequently without roofs which usually means that teaching is suspended whenever it rains. In many class-

rooms there are virtually no educational inputs to be found other than the teacher at the front of the room — no books to read, no benches to sit on, write on and make calculations. There are many reports, too, of teachers who are chronically absent from work, especially in settings where housing for teachers is in short supply or the payment of teachers' salaries is unpredictable. It is inconceivable that very much learning can occur under these conditions... In some African countries — especially in remote rural areas, there are reports of teachers leaving the profession to work in other sectors of the economy... Often the major complaint of teachers assigned to unfamiliar rural areas is the absence of good housing. Frequently, there is not available even rental housing of a reasonable standard (World Bank, 1986).

In some rural Latin American countries, observers report teachers are absent because they must attend meetings or bring official reports to a capital, or take care of some responsibility in off-school premises (Montero-Sieburth, 1986; Fuller, 1985). In Kenyan rural schools, teachers are reported to take off half or whole days from school to attend to second jobs, usually on farms or in small shops. In such situations, students are occasionally monitored by teachers from another classroom, or by older students, but for the most part spend their time unsupervised and untaught (Githiora, 1987).

Absenteeism is the consequence of other elements in the teacher's life. For example, it is likely that teachers' attendance is determined by location of residence, availability of transport, existence of roads, and health conditions. Information about the teacher's life could, therefore, be a starting point for policies to reduce teacher absenteeism.

Practices and policies for the assignment of teachers to schools vary from country to country. In some countries (e.g., Mexico, Pakistan) new teachers are routinely assigned to the more remote schools, no matter what the teacher's background is. Given the adverse conditions of life in rural areas, teachers attempt to transfer to more favorable locations. The

result is that rural schools have a high rate of teacher turnover and largely inexperienced teachers (Marsh, 1984), both of which have negative effects on student learning outcomes (Githiora, 1987).

Ankrah-Dove (1982) identifies two models useful to policymakers considering the assignment of teachers to rural areas: the rural deficit model and the rural challenge model. The rural deficit model takes the perspective that life in rural communities is unattractive to teachers and that consequently they must be compulsorily posted and/or receive a host of incentives to keep them there. The rural challenge model takes the perspective that the rural school provides a special challenge for the motivated teacher and that teachers should be specially trained towards the attainment of the personal maturity and self-reliance necessary to accept that challenge. At the same time, as an added incentive, rural teachers should have career opportunities that equal those of urban teachers.

The implications of Ankrah-Dove's work are that dissatisfaction and turnover among teachers could be reduced by assignment and incentives policies that take into account the career objectives and personal circumstances of teachers. For example, persons who have entered teaching seeking intellectual development can be expected to stay in rural areas only if they are provided with opportunities to continue to develop their intellectual abilities, for example, through in-service training programs. Persons who enter teaching for monetary rewards or job security will not respond to these kinds of incentives, and instead must be offered premiums for working in isolated areas, or long-term contracts. Policies for reducing teacher absenteeism should be context specific, which means that decisions about their application will have to be made in the school, or at the district level.

Efforts in the United States suggest that teacher attendance can be improved by stressing the importance of the issue, documenting and publishing actual costs of teacher absences, making the attendance record part of teacher evaluation, and involving the teacher's immediate supervisor. Absence rates have dropped when teachers talk directly to a supervisor, and therefore have the opportunity to make some alternative arrangement that makes a full day's absence unnecessary (Elliot, 1982).

The implications for developing countries are that policies for reducing teacher absenteeism should be context specific and directed at the school level. Teacher involvement, through mechanisms

such as self-reports, may be inducements to the teacher's own continued attendance, particularly when shared during teachers' meetings. The cost to students of teacher absences can only be speculated upon, but in terms of what this may mean for student achievement or for student participation in school, most educators believe that the cost is significant. Indications from the study and analysis of educational costs for Costa Rica suggest that teacher absenteeism is not only frequent but costly since it is tied to socialized medical visits and also requires hiring substitute teachers (Sanguinetti, 1988). Higher teacher absenteeism or turnover usually means less learning opportunity. Moreover, teacher absenteeism also reinforces educational inequality, as it is more frequent in those areas where the presence of a teacher is the only opportunity to receive schooling.

Student Absenteeism

Educational "wastage," in the research literature for developing countries, refers to a trio of school attendance issues: absence, repetition, and dropping out. For policymakers and researchers, the three issues must be considered together (UNESCO, 1984). "Student absenteeism" is usually defined as chronic student absence from school for reasons other than serious illness or other temporary life situations; "repetition" as the academic failure that, as a consequence, forces a student to be retained in the previous grade; and "dropping out" as a student's departure from school for more than a year. Absenteeism, repetition, and dropping out are closely connected (McDill, Natriello, and Pallas, 1985). For instance, Arancibia (1987) reports that in Latin America high levels of repetition increase the dropout rate, although the correlation between student absenteeism and achievement is inconsistent. In particular, Munoz Izquierdo et al. (1979) found that in Mexico, teacher absenteeism and low teacher expectations exacerbate student absenteeism. High rates of student absenteeism, in turn, are associated with high repetition rates and low rates of school completion.

The situation of women and girls is especially acute (Kelly and Altbach, 1986; Safilios-Rothschild, 1979). UNESCO reports:

In general, the overall trends indicate that women's access to primary education continues to be least in the low income nations of Africa, Asia, but not of Latin America, as well as in North Africa and the Middle East. In these areas, about one-third or less of the primary students are women (UNESCO, 1984).

Educational "wastage" is also generally higher in rural areas and for female students, but "it is also of interest to note that although girl students show greater rates of educational wastage than boys, their wastage is more often due to dropping out while boys' is more often due to repetition of grades" (The World Bank, 1986). Generally, girls' absence from primary school seems to be due less to academic failure than to withdrawing from school for nonscholastic reasons. Boys, on the other hand, tend to remain in school regardless of scholastic performance (Safilios-Rothschild, 1979). However, depending on the context, especially where industrial employment exists, boys drop out and girls stay in. While research indicates that girls drop out to engage in some economic activity, such as becoming workers, mothers' helpers, or guardians, or because they become pregnant, the particular features which cause girls' absences have not been systematically documented. However, in spite of the general trend of reduced learning opportunities for girls, a study from Pakistan (Malik, 1985) found that the dropout rate for girls is just slightly above that for boys, while girls tend to repeat more frequently than boys. No differences were found comparing results from urban and rural areas.

Among the solutions recommended for the alleviation of absenteeism and dropping out in developing countries are: compulsory primary school education; availability of free textbooks and other educational materials; food programs, including breakfast and lunch; health care, including inoculations against infectious disease; programs to help reduce time spent by rural women in household tasks; adapting school calendars to rural labor needs; intensification of training women as primary school teachers; separate school facilities for girls, with women teachers; changing criteria for teacher promotion to include the percentage of girls who finish school; freeing texts of sexist content; and providing literacy programs for illiterate mothers.

One World Bank Report (Haddad, 1979) surveyed two components of educational wastage, repetition, and dropping out, and identified critical variables for policy considerations. In Haddad's report, repetition is considered a higher contributor to wastage because it is a main cause of inefficiency in a school system and because it directly affects dropout rates. In addition, educational costs are greatly increased, Haddad asserts, by high repetition rates which tend to have negative effects on learning.

Haddad has examined criteria for promotion, and concluded that promotion is usually determined by school-based tests which ignore higher level cognitive assessments and the attainment of important social goals of education. He concluded that promotion criteria such as these do not justify their determinative power. While automatic promotion is not proposed as a means to reduce repetition, it is suggested that: 1) new measures be used to assess the rate of learning in the cognitive, affective and social dimensions; 2) promotion standards be modified where retention is very high; 3) school facilities be improved to encourage attendance; and 4) non-graded curricula and ability-grouping practices be used.

Several countries have attempted to reduce educational wastage by implementing preschool programs that help children to adjust to the school environment. Halpern and Myers (1985) conclude in a review of the literature that preschool programs have a modest impact on initial adjustments, although the impact are higher in the developing countries. However, other practices, such as automatic promotion or remedial programs for students that fail, seem to rapidly overcome the impact of early schooling. Preschool programs are more controllable and may result in lower costs. However, their ability to reduce waste or increase academic achievement has not been investigated sufficiently.

Policy Recommendations

- To provide an adequate number of teachers for rural schools, policymakers need to offer both material and non-material incentives to teachers. To effect this policy, ministries of education must be able to differentiate between the career orientations of candidates for teacher positions, and must have the authority to award incentives differentially.
- Teacher absenteeism can be reduced by increased supervision of teachers, either by supervisors or headmasters; by increased motivation (through training opportunities and the like); and by reduction of bureaucratic demands on teachers' time that take them away from their classrooms.
- Policy options to reduce student absenteeism include policies that increase learning, thereby reducing failure and repetition. These can include readiness programs, such as pre-school, or programs to improve quality of instruction. (See sections that follow.) Provision of material incentives such as lunch, health care, and uniforms may act to reduce absenteeism.

Section IV: Factors That Influence How Time is Spent

The previous section reviewed research on factors that limit the total amount of time teachers and students spend in classrooms. This section looks at research on determinants of how teachers and students spend their time in classrooms. The thesis of this section is that the more time students and teachers spend on tasks directly related to the curriculum, the more students will acquire the knowledge, skills, and values that the curriculum is meant to convey. In other words, the more time-on-task, the more learning.

At the same time, of course, how much is learned depends on how that time is spent. Teaching and learning time can vary considerably in terms of "quality", that is, in terms of how much is actually learned as a consequence. (For example, a "boring" teacher can spend even more time than an "exciting" teacher covering a point, and teach less.) Amount of learning is a function of the time spent learning multiplied by the efficiency (or quality) of that time.

This section looks at ways in which teachers can manage time, and instructional materials, to increase not only the amount of time spent on instruction, but the quality of that time.

Instructional materials include: textbooks, workbooks, reading materials, teachers' guides, reference books, maps, charts, games, models, pictures, radio, tapes, slides, motion pictures, and television. Instructional materials are an important variable because they complement, supplement, or replace direct instruction. As such, instructional materials directly affect teachers' instructional and management capacity. When teachers have textbooks and guidebooks these may compensate in part for lower levels of education and training. These materials are the medium which translate curriculum goals into instruction and learning. Finally, textbooks can extend the opportunity to learn and continue to engage students beyond the classroom when students read them at home. The effective management of instructional time often involves creative use of instructional materials, but this optimal use of time is only possible when materials are available.

According to Lockheed (1987) and Fuller (1986),

the influence of school variables on student performance in developing countries is greater than in developed countries where student background variables are more likely to have an effect. Among the school factors that are consistently related to student achievement are the presence and use of instructional materials, time spent on learning, and teacher education (Lockheed, 1987).

Teachers have primary control of the use of instructional materials and directly influence student time spent on learning: this can be called a "proximal" variable with respect to learning outcomes. Teacher education, and the availability of instructional materials are more "distal" variables, and are controlled principally by persons outside the school. The rest of this section discusses in detail the use and provision of instructional materials.

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Instructional Time The Relationship Between Time and Achievement

The relationship of time to achievement has been researched since the 1920s (Smyth, 1985b) in the United States, but the most inspirational study has been Carroll's School Learning Model (Carroll, 1963) which treats learning as a function of time. The model considers learning to be directly influenced by the time that students need to learn, and the quality of instruction given, as well as the time students actually spend on learning (Carroll, 1985).

$$\text{Degree of Learning} = f \frac{\text{time actually spent}}{\text{time needed}}$$

The notion of time-on-task is based on the theory that pupils learn by participation and experience.

Allocated time is the time set aside for teaching and learning activities, and is defined by the number of years required to obtain a diploma, the number of school days in a school year, the number of hours in each school day, and the proportion of a school day that is dedicated to a particular subject matter. Teachers have control over allocated time by the way in which they use it to engage students in learning. (This is known as the time-on-task, or engaged time and academic learning time.) Student learning is affected by how time is actually used, not by the amount of time available (Stalling, 1983). Effective teaching and appropriate task context are necessary to produce achievement gains within the allocated time (Cotton & Savard, 1981). The notion of time-on-task is based on the theory that pupils learn by participation and experience. How time can be used on-task, however, depends on the subject matter, the availability of instructional materials, and how teachers organize such resources (Harnischfeger & Wiley, 1985).

In Mexico, a typical teacher underutilizes 50% of the allocated time by absenteeism, interruptions, lack of planning, early leaving, and non-academic tasks (Munoz Izquierdo et al., 1979). In addition, teachers spend triple the amount of time on reading and writing lessons in the morning sessions as they do in the afternoon sessions: the afternoon sessions have more off-task activities. In Colombia, off-task time has been estimated at 40% (Arancibia et al., 1986). Although it is neither possible nor desirable to spend all academic time-on-task, reducing wastetime will certainly make more time for learning.

The reported correlation between time-on-task and achievement ranges from .09 to .44, mostly in math and reading classes (Frederick & Walberg, 1980). Although in some cases the impact on achievement is positive but not statistically significant (Seifert & Beck, 1983, 1984), in other cases, such as in an Australian study, time-on-task has a strong impact on achievement, accounting for approximately 58% of the variance (Leach & Tunnecliffe, 1984). In Thailand, the time-on-task in mathematics classes was the only classroom-level factor associated significantly with achievement (Classroom Environment Study Report, 1985).

Time and Instruction

From the instructional perspective, how time is used for academic engagement must be considered in connection with pacing and grouping. Pacing is the

rate at which instruction covers a specific amount of curriculum content in a certain time (Karweit, 1983). Some studies have found diverse pacing procedures; however, most teachers pace their instruction to accommodate low achievers (Dahlof, 1971), and this negatively affects the more able students (Barr, 1976). Time-on-task has more impact on students at or below their class mean than on students above their class mean (Karweit & Slavin, 1981). Pacing is affected by the accumulated knowledge and hierarchical nature of the subject matter (Karweit, 1978). During transitions from one activity to another in class, much of the time is off-task and hence affects student engagement (Arlin, 1979).

Seatwork is a very common way of grouping. It requires students to perform tasks, usually reading or writing, on their own, often without direct supervision from the teacher. Research in Thailand indicates that about 30% of teaching activities involved written seatwork (Classroom Environment Study Report, 1985). The impact of seatwork on learning and achievement depends on the availability and appropriateness of textbooks, workbooks, or ditto materials, and the monitoring skills of the teacher. When instructions are not clear and tasks are perceived as too difficult to accomplish, low achievers cannot benefit from seatwork (Anderson, Brubaker, Alleman-Brooks, & Duffy, 1983). As student engagement is positively associated with substantive academic interaction between teachers and students, seatwork which requires students to work on their own decreases interaction and thus often increases time-off-task (Seifert & Beck, 1984; Filby & Cahen, 1985).

Most of the above-mentioned teaching strategies are commonly used in developing countries, although their effectiveness in such environments is controversial. In Thailand, for example, these strategies have been related to achievement (Classroom Environment Study Report, 1985) but in Latin America such strategies have been identified as promoters of non-active learning and related to low achievement (Arancibia, 1986). In some African countries, these teacher-centered strategies are regarded as appropriate to local cultural expectations (Windham, 1985).

In general, teachers can improve student time-on-task by planning activities, giving clear instructions, clarifying the specific objectives to be accomplished, taking student needs and level of ability into account, making high success opportunities avail-

...the research question is not whether homework should be required, but rather for which students and with which tasks, sequences, and structures.

able, and praising students for correct responses (Martin & Canty, 1980).

Homework as an Extension of Time-on-Task

Homework is a very common instructional practice to engage students in learning. Despite its general use, however, it is only recently that researchers have demonstrated its connection with achievement. A review of cross-national strategies conducted by the International Association for the Evaluation of Educational Achievement (IEA) indicated that time spent on homework was one of the best predictors of achievement, when controlling for ability (Wolf, 1979). Consistently, additional cross-national studies report that in six of the eight available studies homework tended to have a positive impact on achievement. In fact, it is one of the school practices that shows a high positive relationship with achievement (Schiefelbein & Simmons, 1981).

At this time, the research question is not whether homework should be required, but rather for which students and with which tasks, sequences, and structures (Coulter, 1979; Pendergrass, 1985). These questions help to find strategies for successful homework management. A study in Venezuela finds that teachers specially trained in providing written feedback on homework are able to significantly increase achievement among their students (Elawar and Corno, 1985).

Other studies show that homework does not improve learning without family support. While the mother is usually the most directly involved in homework, siblings are the helpers in societies where the older generations had no access to schooling. This is the case, for example, among Arabs of the rural areas of Israel (Tamir, 1985).

Finally, school-based home instruction, in which specially trained parents extend or multiply the quality and quantity of academic instruction beyond school time, reduces student time dedicated to "non-educational activities." A quantitative synthesis of 29 studies shows that providing instruction to parents has been successful in over 90% of the cases, improving achievement from the 50th to the 69th percentile of the control group distribution (mean effect at 76th percentile). This strategy, however, is more expensive than homework, and assumes such contextual factors as family and cultural support for learning (Frederick & Walberg, 1980).

Time and Alternative Instructional Approaches

There are alternative approaches that use time in a different way from the conventional classroom: mastery learning allows individual learners to pace their own learning; the Adaptive Learning Environment Model increases the academic engagement time; the Reduced Instructional Time approach reduces the time students need to learn. These delivery systems require the development of special instructional materials, a reorganization of the time frame of study, and a redefinition of the role of the teacher. The following section describes these approaches in more detail.

• *Mastery Learning*

Based on Carroll's model, the mastery learning approach assumes that students with different ability levels require different amounts of time to accomplish the same tasks. Therefore, each student should be given the time she or he needs to accomplish the objective. The curriculum content is broken down into small units of learning to be mastered at the student's own pace. Formative evaluation is provided after the student has completed each unit. The student then moves on to the next level, again at his or her own pace. Individualized teaching and extra-time tutoring are commonly used in this approach (Bloom, 1968).

The mastery learning approach incurs more costs because of the need to train teachers for their new role as tutors, and to develop special materials. However, its supporters consider that the quality effects justify the increase in costs. Critics argue that the quality effects are overstated, although it is not known whether the difference in achievement is due to the increase in time available for slow learners, or to the increased attention and monitoring by the teacher.

Mastery learning has been introduced in Bolivia as a didactic model to improve the quality of instruction (Pena, 1986). However, policymakers should be aware that it has not been proven able to enhance learning at all levels for all kinds of students and that it requires a significant increase in costs.

• *Adaptive Learning Environment*

The Adaptive Learning Environment Model (ALEM) is designed to provide more learning opportunities in regular classrooms through self-paced and individualized instructional strategies. The goals are to permit teachers to spend more time in instruction, to help students to use their learning time more

...some developing countries have few or no instructional resources. In these instances adding a little can make a big impact on achievement.

efficiently, and to improve achievement. Teachers develop skills to monitor student accomplishments, and students are responsible for completing the tasks that are determined by them and the teachers.

This model has increased teacher time on instructional activities and student engaged time in relevant academic activities, and has improved achievement significantly. The program has been applied mainly in mathematics and it is not known how effective it will be with less structured subject matter (Wang, 1985). The ALEM's approach is especially useful in multigraded classrooms and is cost-effective since its aim is to reduce learning time. It also requires minimal organizational change (Thiagarajan & Pasigna, 1988).

• **Reduced Instructional Time Project**

The Reduced Instructional Time project (RIT) in Thailand is one of the best organized low cost learning systems. Its objectives are to find effective instructional methods to reduce the time students need to learn, and to develop appropriate materials to reduce the time teachers need to provide instruction. The RIT project has been successfully implemented in multigraded schools with a student/teacher ratio of 70:1. Instructional materials have been developed and used to foster individual and peer learning, so as to free teachers to monitor students' time-on-task, to help students improve their learning skills, and to provide remedial teaching. The role of teachers changes from being the only source of instruction to managing materials and activities. Teacher instruction time was reduced by 20-30% in the first grade, 30-40% in the second grade, and by 50-90% from the third to the sixth grades (Nichols, 1982; Thiagarajan & Pasigna, 1988).

Although the RIT requires initial investments in material development, teacher training, and organizational changes, it has proven to be cost-effective because it reduces time spent on non-instructional activities, and improves both the quality of instruction and student achievement. Moreover, RIT shows an equalizing effect, as achievement levels for students in rural schools have been raised to those of students in large schools from urban areas (Thiagarajan & Pasigna, 1988).

The research on instructional time reveals that this variable can be controlled by educational policymakers and teachers to raise achievement, regardless of exogenous factors such as socioeconomic background (Heyneman and Loxley, 1983). Improved time management is cost-effective because it focuses on the intensive and effective use of time, an existing

resource, to improve learning, without calling for additional resources.

The improvement of teachers' instructional and management skills is, therefore, a promising policy option for the improvement of learning outcomes and school efficiency. We have discussed several kinds of policies to improve these skills: training for teachers, development and distribution of appropriate instructional materials, development and distribution of materials for self-instruction by students (e.g., workbooks). The table below summarizes what research suggests is the academic impact of policies that affect time-on-task by teachers and students.

A Summary of Research on the Academic Impact of Policies that Affect Time-on-Task

Time-on-Task Policy Options	Academic Impact		
	High	Moderate	Low
Academic learning time	x		
Pacing		x	
Seatwork			x
Direct Teaching	x		
Mastery Learning			x
ALEM/RIT	x		
Homework		x	
School-based home instruction	x		

Instructional Materials

Instructional materials can be broadly divided into two categories: textbooks, which are the most basic of all learning materials, and other materials which include word cards, worksheets, notebooks, dittos, fact sheets, various forms of audiovisual materials, homemade materials from the environment, and programmed materials.

Availability of Textbooks and Achievement

In contrast to industrialized countries where there are a lot of instructional materials, some developing countries have few or no instructional resources. In these instances adding a little can make a big impact on achievement. Having any materials at all becomes increasingly important (Windham, 1985; Thiagarajan & Pasigna, 1988).

Many researchers argue that the availability of the textbook appears to be the most consistent school factor in predicting academic achievement. One

The complexity of the tasks of educational publishing is one reason why quality textbooks are rare.

multinational study reports correlations between textbooks and educational aspirations and achievement in Chile, while educational attainment among underprivileged minority children in Malaysia was found to be particularly associated with textbook availability (Heyneman, 1978). In Uganda, a strong correlation was found between textbook availability in the classroom and student examination performance regardless of student socioeconomic status, and El Salvadorean children without textbooks achieved significantly lower test scores than those who had textbooks (Heyneman, 1978). The Philippines study also reports that the production and distribution of high quality text materials substantially improve student knowledge of science, mathematics and language (Heyneman et al., 1984).

The above mentioned Chilean study — on the influence of school resources, especially textbooks — demonstrated that (1) educational variables are more powerful predictors of occupational attainment than family social status; (2) changes in achievement levels are primarily explained by quality of education rather than family backgrounds; and (3) the main problems connected with textbook utilization are negative teacher attitudes and the inability of poorer children to purchase them (Schiefelbein and Sepulveda, 1983).

What the high correlation between textbooks and achievement shows is not only the effect on the individual student, but also the effect a teacher has when using textbooks.

When few or no students have textbooks, the teacher has to use the textbook as a guide, and rely on the blackboard or on oral dictation; and students have to copy materials into their own notebooks....This wastes the time and energy of both teacher and students. Where most or all students have texts, a teacher has the option of working with small groups...and of engaging in other teaching practices. If this is the case then textbooks may be important not simply as learning aids for individual students who have them, but as a necessary condition for teachers to use more effective teaching techniques (Heyneman, 1978:23).

Textbooks, however, are often not available in developing countries. The acute shortage of textbooks adversely affects teachers' ability to teach and manage the class:

(In) Liberia in 1983, a majority of classrooms had few if any textbooks for every twenty primary school students. In Somalia in 1984...a shortage of 2,280,000 textbooks existed relative to what the national curriculum required for primary education. Even in Botswana, a relatively prosperous nation with a geographically concentrated population and good transportation...in 1984...shortages of textbooks and delayed delivery of instructional materials [were common]" (Windham, 1985:35).

That instructional materials so basic as the textbook are not made available is due to many reasons. Many developing countries do not provide free textbooks because their educational expenditures are limited, and this puts children from poor families at a severe disadvantage. In Ecuador, for example, updated first grade textbooks were made available in 1970 but were priced at slightly more than a day's wage for a laborer (Heyneman, 1978). This is a prohibitive cost for poor families. Another reason for the nonavailability of textbooks is the problem with the delivery system. Many rural areas are inaccessible, and thus even with a free distribution system, textbooks do not always get delivered.

The complexity of the tasks of educational publishing is one reason why quality textbooks are rare. Textbooks must be accurate in content, up-to-date, and educationally sound; otherwise they may encourage counterproductive teaching methods. A study of mathematics textbooks in the Dominican Republic found that the textbooks taught mathematics "as a set of rules, a rigid discipline in which there is little place for creativity" (Luna et al., 1986:9). Furthermore, good textbooks must also be visual and

offer structure, variety, and present materials in different ways...(They) should motivate...and reinforce...(Textbooks) must be organized and divided into units that fit the classroom situation and the time available for teaching the subject...(They) should provide for individualization, for the different abilities represented in the classroom... Good textbooks require creative and seasoned authorship, developed and supported by a professional organization specializing in educational publishing"(Neuman, 1980:11).

Textbook publishing entails selecting and coordinating an author team; coordinating content with curriculum; determining the general appearance of

Teachers select the textbooks that they consider suitable to their students' backgrounds and abilities.

the book; creation of the artwork; specifying the typesetting, printing, and binding; determining the need for ancillary materials to accompany the student textbooks; setting prices; marketing; warehousing and distribution; collecting feedback from teachers. Reviewing, editing, rewriting, testing, and re-editing the content material are essential to the process of producing good textbooks. This process often takes several years (Neumann, 1980; Searle, 1985).

Textbooks are often of poor quality because of the lack of creative and seasoned authors who should be subject specialists and educational communicators at the same time, and also because of the lack of editorial and management expertise. The publishing tasks are complex, and there has not been comprehensive planning and long term commitment. In comparison, financing may be less of a problem because publishing does not involve very advanced or expensive technology (Pearce, 1982; Searle, 1985).

There are, however, success stories of governments publishing and distributing free textbooks, the Mexican case being one of the most notable of them. Mexico has had twenty years of experience with the development, publication, and distribution of free primary school textbooks (Neumann and Cunningham, 1982). Not only is the government able to provide every child with free textbooks in Spanish, but it has also published textbooks in a number of indigenous languages. The textbooks are colorful and well designed. Teachers select the textbooks that they consider suitable to their students' backgrounds and abilities. The Mexican government accords the production and distribution of textbooks the same priority as teachers' salaries and school buildings in its budget allocations. At the same time, the government also supports a dynamic private publishing industry.

The Mexican experience shows that textbooks must be a long-range government commitment supported by regular and adequate annual expenditure. In the Mexican case, this has ranged from between 2-4% of the total annual educational expenditures. The lesson here is that development of an effective textbook program requires a serious political commitment, as well as adequate funding.

Relevance of Instructional Materials

Relevance refers to the match between textbook characteristics and the interests and values of students, parents, community members, and the larger

society. It is possible for materials to be highly relevant at one level, e.g., for one community but less so for another. In general, national curriculum boards are concerned only with relevance at the national level. The correlation between the degree of relevance of instructional materials and level of student achievement has been evaluated in several studies.

Chesterfield (1978) found that rural Brazilian elementary school children made statistically significant gains in word use and descriptive power in reading and writing after a year of using instructional materials (textbooks, charts, and posters) containing words and imagery appropriate to the locale but with structural situations equivalent to the basic first-grade text used in the area. In a multinational study of bilingual education programs, Dutcher (1982) found that minority language children who received primary instruction in their mother tongue, were more likely to improve academically than were minority children taught in a second language. This is attributed, in part, to the fact that literacy attainment is more easily achieved in a first language if the child has reached a cognitive level appropriate for learning basic skills. In the National Education Commission's review of Thailand, "Determinants of Effective Schools," BRIDGES' Education Development Discussion Paper #1, the use of comic books in contrast to conventional methods was shown to promote effective learning, particularly in relation to health education in the seventh grade.

Finally, a UNESCO report of a Study Group Meeting for the Education of Disadvantaged Groups and Multiple Class Teaching in Asia and the Pacific (1980) described a number of programs—most of them in small rural schools or disadvantaged urban schools—tailored to the needs of minority, female, and handicapped children, including the use of instructional materials in tribal languages and self-learning modules for multiple-grade classrooms. Preliminary evaluations of most of these programs report positive gains in student achievement and teacher satisfaction.

Utilization of Textbooks

How textbooks are utilized makes a difference in learning. The Dominican study finds no achievement gains in schools which have textbooks (Luna et al., 1986). The ZIMSCI teacher training project in Zimbabwe reports no change in learning outcomes when teachers were not trained in the use of available textbooks. A Chilean study also confirms that "less

*...a study in Ghana finds positive correlations
between the use of daily newspapers
as instructional materials and reading achievement.*

experienced teachers are less likely to use textbooks than those with more experience, and 78 percent of all the teachers in the survey expressed negative or ambivalent attitudes toward the use of textbooks" (Psacharopoulos and Woodhall, 1985). In other words, merely providing teachers or students with textbooks does not ensure that teachers will use them in instruction, nor that gains in learning will result.

These findings point out the importance of teacher training in using textbooks to improve their teaching and learning outcomes. The introduction of new textbooks and new curriculum, therefore, requires careful preparation, promotion, and publicity. Teacher's editions and allied materials are particularly helpful to less qualified teachers. At the same time, a well structured program of teacher training should include the analysis and effective use of textbooks (Neumann, 1980).

Other Instructional Materials

Instructional materials other than textbooks have been shown to have an effect upon achievement. For example, a study in Ghana finds positive correlations between the use of daily newspapers as instructional materials and reading achievement (Heyneman, 1978). A Brazilian study reports that the reading and writing abilities of primary school children improve after using posters and charts depicting environmentally-specific words and imagery (Chesterfield, 1978). An experimental study in Venezuela finds improvement in children's achievement in mathematics when teachers provide written feedback (Elawar and Corno, 1985).

In other words, there are several kinds of instructional materials—of which textbooks are one—that use print to communicate information and to generate learning. The choice of material should depend on ease of production and distribution, unit cost, and relative effect on learning outcomes.

"Mastery learning" is an effective teaching strategy that uses programmed instructional materials. The materials present the subject matter divided into small units, require frequent student response with immediate feedback, and have been successful in developed countries (Kulik, Shwartz, and Kulik, 1982; Anderson, 1985). Such projects in the Philippines (Chapman and Boothroyd, 1986), Indonesia (Mudhiman, 1981), Liberia (Nichols, 1982), and Thailand (Potar, 1984) play a significant role in improving the efficiency of primary education. The Thai RIT project reports higher learning gains for experi-

mental groups in rural areas, and higher average scores in five subject areas, Thai language, mathematics, life experiences, character development, and work education (Pasnica, 1986). However, because mastery learning and programmed instructional materials minimize teachers' direct instruction, they require literacy skills and self-initiative, and may have limited use in the early grades (Thiagarajan & Pasnica, 1988). The adoption of these approaches also requires an efficiently administrated system to develop the materials, distribute them, and to provide assessment and feedback. As adequate literacy and efficient delivery systems are not common in developing countries, these self-instructional materials have limited applications and the role of the teacher remains central to the student learning process.

Instructional materials produced by government or commercial publishers, which are developed to serve the official curriculum and to attain national, cultural, and educational goals, may or may not meet the personal needs of teachers and students. For this reason, educators have advocated that teachers produce their own materials, on the grounds that they are in the best position to know which materials and teaching methods are most effective in their classrooms (Hawes, 1976). Teacher produced instructional materials are likely to reflect teachers' beliefs, perceptions and expectations about their students, and serve "as a source of ideas, guides to planning, and definition for what is possible" (Kerr, 1981:368). Unfortunately, they are also likely to vary in quality, introducing inequalities in the quality of instruction provided across classrooms and schools. This problem can be offset either by supervision of teachers to ensure common high standards of quality, or by district-wide workshops with teachers to ensure uniform quality and application.

Expecting teachers to create instructional materials, however, presupposes the teacher's knowledge of instructional development and production techniques. A study of Australian elementary school teachers' knowledge and use of social studies curriculum materials finds that most teachers have very little involvement in materials development, show little interest in the content, and are mostly concerned with meeting course requirements when selecting topics (Marsh, 1984). Therefore, training teachers to develop instructional materials from locally available resources is necessary (Komoski, 1980). While teacher resource centers to produce

...training teachers to develop instructional materials from locally available resources is necessary.

teacher-made materials have been developed in Ghana, they have been underutilized due to poor communication and management (Kyei-Anti, 1983). Instead, it appears that optimum conditions for developing materials may be found in school-based clusters which work jointly with the community at large. Both pre- and in-service training programs could be organized for teachers to encourage them to produce their own instructional materials.

Teacher Training

The teacher is one of the most important factors in helping students learn, given that the more scarce the resources, the more innovative the teacher must be. To compensate for adverse working conditions, teacher training is of vital importance. Recent literature suggests that pre-service training is less useful than in-service training because the trainees have no relevant experience in a real setting, whereas in-service training is more effective with unqualified, practicing teachers (Verspoor and Leno, 1986). In-service Education and Training of Teachers (INSET) has been seen as a means of revitalizing general morale within the teaching profession as a whole since it provides a lifelong, ongoing process for gaining acceptability for educational change and reform. One of the major trends in INSET is to shift the base of training from specialist institutions to individual schools and to focus on their needs. New and low cost in-service teacher training strategies use study circles, or clusters, and networks to disseminate new ideas and innovative practices. In these clusters and networks, teachers participate in identifying training needs and develop instructional materials to deal with local problems. Thailand, Sri Lanka, and the Philippines have developed successful models of this kind of teacher training. Simulation and peer critique are also found to be very effective in improving teaching practices.

Other options to consider are distance education, and the mobile teacher training units which are often established to support correspondence study (Guthrie, 1985). Radio can also be used as a form of on-the-job training, although it has more implications for curriculum reform.

As multigrade classrooms are a common feature in developing countries, this issue must be addressed in relation to effective teaching and classroom management. Stromquist (1982) has shown that multigrade teaching makes teachers individualize instruction and play the role of tutor rather than lecturer.

In addition, multigraded classes increase the size of the school, and several research studies suggest that the efficiency of the school increases until a certain size is reached (about 200 at the elementary level). Bray (1987) lists some possibilities for multigrade teaching which include a different arrangement of desks and two sets of blackboards for addressing students in different grade levels. The use of para-professionals, aides, and older children as tutors for younger children also helps to give more attention to individual students.

The teacher training curriculum should provide a knowledge of content areas, time management skills, instructional strategies, organizing skills, interpersonal skills, and techniques for producing simple instructional materials. Since teaching is directive, active, engaging, and complex, incorporating both social and academic domains, teacher training that extends this sensitivity is most useful.

Research has indicated that it is how teachers use instructional materials that makes an impact on learning (Luna, 1986; Schiefelbein, Farrell and Sepulveda-Stuardo, 1983). Too often, teachers make students recite from textbooks, and encourage passive learning. Therefore, training teachers to use instructional materials to engage students in active learning is very important (Komoski, 1980). Teachers should also be trained to select instructional materials that are appropriate to the levels of their students.

Researchers have suggested that teachers in developing countries become involved in the production of instructional materials for local-level use in rural schools, since it is assumed that teachers are in the best position to know which materials and teaching methods would have the most positive effects on achievement (Hawes, 1976).

Policy Recommendations

- Student time-on-task can be increased by activities that engage the student while the teacher is busy on other matters. These include seatwork (use of notebooks, workbooks, exercise sheets, assignments), homework, and self-instructional materials. The effectiveness of seatwork depends on the quality of the materials (that is, the substantive content) given to the students. The effectiveness of homework in terms of learning outcomes is increased considerably by:

- a) parental participation with students in the homework. This clearly depends on the educational level of the parents and their disposition. Teaching

New and low cost in-service teacher training strategies use study circles, or clusters, and networks to disseminate new ideas and innovative practices.

parents how to instruct their children at home has an appreciable impact on learning in school.

b) prompt feedback by teachers with respect to student performance on homework. Self-instructional materials (e.g., programmed instruction booklets) can be very effective, but considerable investment is required in the design and development of the materials. Over time the investment in development of these materials can prove to be cost-effective.

- The proper utilization of any new technology of instruction requires training. This is true for teacher use of seatwork, homework, and even self-instructional materials. Teacher training is, therefore, an essential component for any of the policy options discussed. Research has not discussed which kinds of training are most appropriate.

- In countries in which most students do not now have textbooks, provision of textbooks is the most cost-effective way to improve learning outcomes. Textbooks have this effect for several reasons, in part because they permit students (and teachers) to spend

more time on academic tasks and in part because they are more likely than other materials to be closely linked to the official curriculum.

- Textbooks can be used in ways that do not raise levels of learning. Training teachers in methods of textbook utilization can significantly increase the contribution of textbooks to increased learning outcomes. Textbooks should not be introduced without training in their utilization.

A Summary of Research on Academic Impact of Instructional Materials

Instructional Materials	Academic Impact		
	High	Moderate	Low
Availability			x
Use		x	
Relevance		x	
Textbooks			x

Section V: Conclusion: Policy Options

The thesis of this review has been that some gains in learning outcomes can be produced by a more judicious use of existing resources; that is, without large expenditures on education. I have argued that teachers are the central actors in any program to improve learning outcomes, because they have the most effect on learning in classrooms, and can also have some effects on learning outside the classroom. The methods that teachers employ in utilizing resources for the teaching-learning process were defined as classroom management practices.

This final section summarizes the results of the previous discussion in terms of policies that have a direct effect on instructional time, policies that affect the use of instructional time through instructional materials, and policies that attempt to increase teachers' skills in classroom management.



Improving teachers' use of what is already available or improving their design skills can increase quality without increasing overall costs.

Instructional Time

- Teacher absenteeism can be reduced by policies that:
 - a) place teachers closer to their family residence.
 - b) increase supervision of teachers by headmasters or supervisors.
 - c) reduce the need for teachers to be absent from school to arrange salaries, promotions, transfers, etc. This can be done by supervisors or headmasters instead.
 - d) provide incentives to teachers in terms of their career orientations. Example: workshops to exchange information on pedagogy, etc.
- Student absenteeism can be reduced by policies that:
 - a) increase learning, thereby reducing failure and repetition. This can be done through readiness programs such as preschool; by changing promotion standards where there is a high repetition rate; or by improving students' ability to pass, through improving teaching and offering remedial programs.
 - b) provide material incentives for attendance such as free lunch, health care, and uniforms.
 - c) include more radical steps such as non-graded curricula, or a broadening of the definition of desirable learning to include social and affective skills as well as academic skills.
- Central policies can affect how teachers use their time in classrooms:
 - a) by reducing time spent on non-instructional matters. Example: policies that relieve teachers of administrative duties by reassigning them to supervisors and aides.
 - b) by providing incentives for attention to the instructional task. Example: policies that reward teachers for academic performance of students (e.g., on a standardized test).
 - c) by providing instructions on how teachers should spend their time. Example: teacher guides and manuals that clearly specify how teachers should conduct their classes.
 - d) through training, both pre-service and in-service, that instructs teachers in methods and strategies for effective instruction.
- Policies can also affect teacher involvement in how students employ their time outside the classroom:
 - a) by training teachers to assign more homework and to provide feedback to students about it.
 - b) by motivating parents to increase their involvement in their children's learning at home. Parents can't teach children to read if they don't know how to read. However, teachers/supervisors may train parents through special meetings or training sessions.

Instructional Materials

Improvements in the supply and in the quality of instructional materials can affect both the amount of time spent on instruction and learning, and the efficiency (or quality) of that time.

- a) Research shows that the single most important instructional material is the textbook.
- b) Expendable instructional materials and equipment such as blackboard, chalk, pencils, maps, dictionary, etc., increase time-on-task (Windham, 1985).
- c) Teachers can introduce local materials that also help to improve the quality (relevance) of the instructional process (Laesa, 1983).
- d) The contribution of improvements in the quality and quantity of instructional materials to improved learning outcomes can be increased considerably by training teachers in their utilization.

Policymakers usually consider the production of instructional materials an important aspect of the educational system. These materials not only enhance the qualitative aspects of educational services, but are also a means to promote citizenship and national integration. A common goal of many national plans has been the local production of official textbooks to promote nationalism.

In addition, if they are distributed free, as in Mexico, or heavily subsidized, it has been assumed that textbooks provide greater educational opportunities to those children whose parents cannot afford school supplies. However, materials alone are insufficient to make an impact on learning. They must be efficiently used by teachers, who will usually need special training to do so. If, textbooks do make an important difference in academic achievement, as has already been documented, policymakers should not think only in an additive way. More does not necessarily mean better. How teachers actually use the existing instructional materials varies widely from teacher to teacher, and this variable has the greatest impact on achievement. Where it is not possible for the teacher to be a creative agent by designing his or her own materials — which requires special skills and knowledge — instructional materials should be selected carefully so they fit the curriculum goals and type of student.

Knowledge of what is available and what impact

it has on learning may avoid a bias towards considering textbooks as the most important material. Improving teachers' use of what is already available or improving their design skills can increase quality without increasing overall costs. Consequently, increasing the teacher's classroom management skills could improve the internal efficiency of schooling, and maximize the value of existing instructional materials by making better use of them.

This is important, given that between 80 and 90% of the education budget is usually spent on teacher and administrative salaries. Very limited economic resources can be allocated to the production and development of instructional materials, and most developing countries will not be able to increase their educational budget in the near future. These economic realities limit the alternatives to: asking for international aid in order to produce local textbooks, as has been the case with projects run by international agencies like the World Bank, UNESCO, and USAID and; developing low-cost innovative systems, where it is possible to increase the teacher/student ratio, and at the same time, promote quality, or modifying existing teacher training programs to emphasize local development of instructional materials.

To enhance academic achievement through educational materials, policymakers will have to consider low cost alternatives because few developing countries are able to produce a set of materials for each pupil for each school year. As a consequence, options such as producing inexpensive books designed to be used by many pupils for some years (i.e. comic books, newsprint materials, etc.), promoting the implementation of low cost learning systems, and enhancing teachers' ability to design their own materials (making use of local raw materials) may be preferred choices.

However, policymakers need to take into account several points:

- a) In most systems, the teacher is the single most important agent in the educational process, because traditional strategies are based on teachers' control of classroom interactions and allocation of learning resources.
- b) Parental preference for traditional teaching strategies may preclude the introduction of innovative measures to deal with student absenteeism and drop out.
- c) The production of new instructional materials should be coordinated with training teachers in the design, selection, and use of the materials.

d) Education is a human-intensive process requiring intervention and monitoring; thus the use of unconventional materials and methods such as programmed instruction and mastery learning should be properly managed by teachers. Teacher training is an investment in teachers' skills and knowledge for classroom management. Enhancing the quality of instruction and management will reduce the need for investment in expensive materials.

The idea of classroom management is double-edged: it can be used by policymakers as a control to obligate teachers to follow strict schedules, pedagogy, curriculum orientation, etc. But in a larger sense, the idea of classroom management is a tool for strength-

ening the teacher's knowledge of her/his role. By becoming more aware of this role, and the interactive aspects of the teaching-learning process, teachers enhance the students' ability to learn.

Instructional strategies and the allocation of learning resources present challenging tasks for the educational attainment of developing countries. Yet, because policymakers and researchers alike are concerned with finding the most efficient and effective means for providing quality education, it seems that the investment in teachers' management capabilities may be a small price to pay, with greater returns on the investment than any other present course of action.

Bibliography

Alexander, K.L.; Fennessey, J.; McDill, C.L.; & D'Amico, R.J. "School SES Influence — Composition or Context?" *Sociology of Education*, 52, 1979, pp. 222-237.

Altbach, P. G. *The Knowledge Context: Comparative Perspectives on the Distribution of Knowledge*. Albany: State University of New York Press, 1987.

Anderson, L.; Brubaker, N.; Alleman-Brooks, J.; & Duffy, G. "Students' Responses to Classroom Instruction: Final Report, NIE-G-80-0073." East Lansing: The Institute for Research on Teaching, 1983.

Anderson, L. W. "A Retrospective and Prospective View of Bloom's Learning for Mastery." In M.C. Wang & H.J. Walberg (Eds.), *Adapting Instruction to Individual Differences*. Berkeley, CA: McCutcheon Publishing Corp, 1985.

Anderson, S.L. "Does Time on Task Work for Teacher Training Too?" Paper presented at the Annual Meeting of the American Educational Research Association, Montreal, Canada (ERIC # ED 243 839), 1983.

Anderson, S.L., & Lorin, W. "The Classroom Environmental Study: Teaching for Learning." *Comparative Education Review*, 31(1), 1987, pp. 69-87.

Ankrah-Dove, L. "The Deployment and Training of Teachers for Remote Rural Schools in Less-Developed Countries." *International Review of Education*, 27, 1982, pp. 3-27.

Anyon, J. "Schools as Agencies of Social Legitimation." *International Journal of Political Education*, 4(August), 1981.

Apple, M. "Making Knowledge Legitimate: Power, Profit and the Textbook." In A. Molnar (Ed.), *Current Thought of Curriculum*. Alexandria, VA: ASCD Yearbook, 1985.

Arancibia, V. et al. "Manejo Instruccional del Profesor en la Sala de Clases: Revision del Estado del Arte." Santiago, Chile: BRIDGES Project, Mimeo, 1986.

Arlin, M. "Teacher Transitions Can Disrupt Time Flow in Classrooms." *American Educational Research Journal*, 16, 1979, pp. 42-56.

Arlin, M. "Time Variability in Mastery Learning." *American Educational Research Journal*, 21(1), 1984, pp. 103-120.

Arlin, M. & Webster, J. "Time Costs of Mastery Learning." University of British Columbia: *Journal of Educational Psychology*, 75(2), 1983, pp. 187-195.

Avalos, B. "Training for Better Teaching in the Third World: Lessons from Research." *Teaching and Teacher Education*, 1(4), 1985, pp. 289-299.

Barr, R. & Dreeben, R. "Sociological Perspective of School Time." In C.W. Fisher & D.C. Berliner (Eds.), *Perspectives of Instructional Time*. New York: Longman, 1985.

Bennett, N. et al. *Teaching Styles and Pupil Progress*. Cambridge, MA: Harvard University Press, 1976.

Berliner, D.C. "Tempus Educare." In P.L. Peterson & H.J. Ealberg (Eds.), *Conceptions of Teaching*. Chicago, IL: National Society for the Study of Education, 1978.

Berliner, D.C. "The Half-Full Glass: A Review of Research on Teaching." In P.L. Hosford (Ed.), *Using What We Know About Teaching*. Washington: A.S.C.D., 1984.

Bloom, B.S. "Learning from Mastery." Reprinted in C.W. Fisher & D.C. Berliner (Eds.), *Perspectives of Instructional Time*. New York: Longman, 1968.

Bloom, B.S. *Human Characteristics and School Learning*. New York: McGraw Hill, 1976.

Borg, W.R., & Ascione, F.R. "Changing On-Task, Off-Task and Disruptive Pupil Behavior in Elementary Mainstreaming Classrooms." *Journal of Educational Research*, 72, 1979, pp. 243-252.

Bossert, S.T. *Tasks and Social Relationships in Classrooms*. Cambridge: Cambridge University Press, 1979.

Brenes, M.; Campos, N.; Garcia, N.; & Rojas, M. "Interaccion Verbal cu el Aula: Analisis Micro-Etnografico en una Escuela de una Comunidas Urbano-Marginal en Costa Rica." *Primer Encuentro Centro Americano y Cuarto Encuentro Nacional de Investigadores en Educacion*. CIPET, Alajnela, Costa Rica, October 1-3, 1987.

Brophy, J. *Classroom Organization and Management*. East Lansing: The Institute for Research of Teaching, Michigan State University, Occasional Paper No. 54, 1982.

Brophy, J. "Teacher Effects Research and Teacher Quality." *Journal of Classroom Interaction*, 22(1), 1986, pp. 14-23.

Brophy, J. & Good, T. L. "Teacher Behavior and Student Achievement." In M.C. Wittrock (Ed.), *Handbook of Research on Teaching: Third Edition*. New York: MacMillan Publishing, 1986.

Brophy, J.; Rohrkemper, M.; Rashid, H.; & Goldberger, M. "Relationships Between Teachers' Presentations on Classroom Tasks and Students' Engagement in Those Tasks." Michigan State University: Institute for Research of Teaching, 1982.

Calderhead, J. *Teachers' Classroom Decision Making*. New York: Holt, Rinehart and Winston, 1984.

Carroll, J.B. "A Model of School Learning." *Teachers' College Record*, 64(8), 1963, pp. 723-733.

Carroll, J.B. "A Model of School Learning." In Charles W. Fisher and David C. Berliner (Ed.), *Perspectives on Instructional Time*. New York: Longman, 1985.

Cazden, C.B.; Carrasco, R.; Maldonado-Guzman, A.A.; & Erickson, E. "The Contribution of Ethnographic Research to Bicultural Bilingual Education." In J. Alatis (Ed.), *Current Issues in Bilingual Education*. Washington, DC: Georgetown University Roundtable on Language and Linguistics, 1980.

Chapman, D.A., & Boothroyd, R. *Programmed Instruction as a Means of Improving Student Achievement: A Look at the Liberal IEL Project*. Albany, NY: State University of New York at Albany, 1986.

Chesterfield, R. "Effects of Environmentally Specific Materials of Reading in Brazilian Rural Primary Schools." *The Reading Teacher*, December, 1978, pp. 312-315.

Clark, Carol A. M., & Yinger, R.H. "The Hidden World of Teaching: Implications of Research on Teacher Planning." (Research Series No. 77). East Lansing: Michigan State University, Institute for Research on Teaching, 1980.

Cleminshaw, H.K., & Guidubaldi, J. "The Effect of Time and Structure on Kindergarten Student Social and Academic Performance." *The Journal of Educational Research*, 73(2), 1979, pp. 92-101.

Cobb, J.A. "The Relationship of Discrete Classroom Behaviors to Fourth-Grade Academic Growth." *Journal of Educational Psychology*, 63, 1976, pp. 74-80.

Cooley, W.W., & Mao, B.J. "The Sample of Classroom Time Observed." *Journal of Classroom Interaction*, 17(1), 1981, pp. 31-36.

Cotton, K., & Savard, W.G. *Time Factors in Learning*. Research of School Effectiveness Project, Topic Summary Report. Portland: Alaska Department of Education, Northwest Regional Educational Laboratory. (ERIC #ED 214 706), 1981.

Coulter, F. "Homework: A Neglected Research Area." *British Educational Research Journal*, 5(1), 1979, pp. 21-33.

Cronbach, J.L., & Snow, R.E. *Aptitudes and Instructional Methods: A Handbook for Research on Interactions*. New York: Irvington, 1977.

Crossley, M., & Guthrie, G. "Current Research in Developing Countries: INSET and the Impact of Examinations on Classroom Practice." *Teaching and Teacher Education*, 3(2), 1987, p. 68.

Dahloff, U. *Ability Grouping, Content Validity and Curriculum Process Analysis*. New York: Teachers' College Press, 1971.

Davidson, J.L., & Holley, F.M. "Your Students Might be Spending Only Half of the School Day Receiving Instruction." *The American School Board Journal*, 1979(March), pp. 40-41.

Denham, C., & Lieberman, A. (Eds.) *Time to Learn*. Washington, DC: U.S. Department of Education, National Institute of Education, 1980.

Doane, B.S. "The Effects of Homework and Locus of Control on Arithmetic Skills Achievement in Fourth Grade." *Doctoral Dissertation*, Abstracts International, 73-8160, New York University, 1972.

Doyle, W. "Classroom Organization and Management." In D. Wittrock (Ed.), *Handbook on Research in Teaching: Third Edition*. New York: MacMillan, 1986.

Duffy, G. "Theory to Practice. How Does it Work in Real Classrooms?" *Research Theories No. 98*. East Lansing: Institute for Research on Teaching, Michigan State University, 1981, pp. 1-24.

Dutcher, N. "The Use of First and Second Languages in Primary Education: Selected Case Studies." Washington, DC: The World Bank, Staff Working Paper No. 504, 1982.

Dworkin, A. G. "The Changing Demography of Public School Teachers: Some Implications for Faculty Turnover in Urban Areas." *The Sociology of Education*, 53(April), 1980, pp. 65-73.

Edmonds, R.R. "Effective Schools for the Urban Poor." *Educational Leadership*, 1979, p. 37.

Elliot, P.G. "Update on Teacher Absenteeism." *The Practitioner*, 8(2), 1982, pp. 1-12.

Featherstone, H. "Homework." *The Harvard Educational Letter*, 1(1), 1985, pp. 1-3.

Filby, N.N., & Cahen, L.S. "Teacher Accessibility and Student Attention." In C.W. Fisher & D.C. Berliner (Eds.), *Perspectives on Instructional Time*. New York: Longman, 1985.

Fisher, C.W. et al. "Teaching Behaviors, Academic Learning Time and Student Achievement: An Overview." In Denham and A. Lieberman (Eds.), *Time to Learn*. Washington, DC: NIE, 1980.

Frederick, W.C. "Use of Classroom Time in High Schools Above or Below the Median Reading Score." *Urban Education*, 11, 1977, pp. 459-464.

Frederick, W.C., & Walberg, H.J. "Learning as a Function of Time." *The Journal of Educational Research*, 73(Mar/Apr.), 1980, pp. 183-194.

Fuller, B. "Raising School Quality in Developing Countries: What Investments Boost Learning?" Washington, DC: The World Bank, Education and Training Department, Report No. EDT7, 1985.

Fuller, B. "Observing School Qualities in the Third World: A Note on Methods." Washington, DC: The World Bank, 1986.

Gettinger, M. "Effects of Learner Ability and Instructional Modifications of Time Needed for Learning and Retention." *Journal of Educational Research*, 76(6), 1983, pp. 362-369.

Githiora, W. Personal communication, 1987.

Good, T. "Research of Classroom Teaching." In L. Shulman & G. Sykes (Eds), *Handbook of Teaching and Policy*. New York: Longman, 1983.

Gore, D.A., & Roumagoux, D.V. "Wait-Time as a Variable in Sex-Related Differences During Fourth-Grade Mathematics Instruction." *Journal of Educational Research*, 76(5), 1983, pp. 273-275.

Graden, J.; Thurlow, M.L.; & Ysseldyke, J.E. *Academic Engaged Time and its Relationship to Learning: A Review of the Literature*. Institute for Research on Learning Disabilities, Monograph No. 17, January. (ERIC # ED 228 290), 1982.

Guerra, Pena, A. "Algunos Modelos Didactics." *Revista Educativa de la Iglesia Metodista en Bolivia*. No. 2, II. Praxis Metodista, December 1986.

Guida, F.; Ludlow, L.H.; and Wilson, M. "Academic Anxiety, Time-on-Task, and Achievement: A Structural Model." Paper presented at the American Educational Research Association Meeting, Montreal, Canada. (ERIC # ED 228-290), April, 1983.

Guthrie, G. "Current Research in Developing Countries: The Impact of Curriculum Reform on Teaching." *Teaching and Teacher Education*, 2(1), pp. 81-89.

Haddad, Wadi D. "Educational and Economic Effects of Promotion and Repetition Practices." Washington, DC: The World Bank, Staff Working Paper No. 319, 1979.

Halpern, M., & Myers, R. "Effects of Early Childhood Intervention on Primary Schools Progress and Performance in the Developing Countries." Washington DC: USAID Bureau for Program and Policy Coordination, 1985.

Hanson, R.A., & Schutz, R.E. "The Effects of Programmatic R & D on Schooling and the Effects of Schooling on Students." Technical Report 53, Southwest Regional Laboratory for Educational Research and Development, 1975.

Harnischfeger, A., & Wiley, D.E. "The Teaching-Learning Process in Elementary Schools: A Synoptic View." *Curriculum Inquiry*, 6(1), 1976, pp. 5-43.

Harnischfeger, A., & Wiley, D.E. "Origins of Active Learning Time." In C.W. Fisher and D.C. Berliner (Eds.), *Perspectives on Instructional Time*. New York: Longman, 1985.

Harnqvist, K. "Changes in Intelligence from 1 to 18." *Scandinavian Journal of Psychology*, No. 9, 1968, pp. 50-82.

Hawes, H.W.R. "Locally Based Educational Research and Curriculum Development in Developing Countries - The Teacher's Role." UNESCO, International Institute for Educational Planning, 1976.

Hawkinson, H. "Hatch School Not at Risk." *Phi Delta Kappa*, 66, (3), 1984, pp. 181-187.

Henry, J. *Culture Against Man*. New York: Vintage Books, 1963.

Heyneman, S.B.; Farrel, J.P.; & Sepulveda-Stuardo, M.A. "Textbooks and Achievement: What We Know." Washington, DC: The World Bank, Staff Working Paper No. 298, 1978.

Heyneman, S.B., & Loxley, W. "The Effect on Primary School Quality of Academic Achievement Across Twenty-Nine High and Low-Income Countries." *American Journal of Sociology*, 8(6), 1983, pp. 1162-1194.

Heyneman, S.; Jamison, D.T.; & Montenegro, X. "Textbooks in the Philippines: Evaluation of the Pedagogical Impact on a Nationwide Investment." *Educational Evaluation and Policy Analysis*, 6(2), 1984, pp. 139-150.

Hiscox, S. et al. *How to Increase Learning Time*. Washington, DC: Department of Education. (ERIC # Ef 254 522), 1982.

Hornberger, N.H. *Schooltime, Classtime and Academic Learning Time in Rural Highland Puno, Peru*. Unpublished paper. University of Pennsylvania, Graduate School of Education, 1987.

Husen, T. "Does More Time in School Make a Difference?" *Saturday Review*, April, 1972, pp. 32-35.

Hyman, H.H.; Wright, C.R.; & Reed, J.S. *The Enduring Effect of Education*. Chicago: University of Chicago, 1975.

Jackson, P. *Life in Classrooms*. New York: Holy, Reinhart and Winston, 1968.

Karweit, N.L. "Organization of Time in Schools: Time Scales and Learning." Paper presented at NIE Conference on Productivity, San Diego, 1978.

Karweit, N. "Time-on-Task: A Research Review." Center for Social Organization on Schools, Report No. 332. Baltimore, MD: The Johns Hopkins University, 1983.

Karweit, N. "Should We Lengthen the School Term?" *Educational Researcher*. June/July, 1985.

Karweit, N. "Time Scales, Learning Events, and Productive Instruction." In C.W. Fisher and D.C. Berliner (Eds.), *Perspectives on Instructional Time*. New York: Longman, 1985.

Karweit, N.L., & Slavin, R.E. "Measurement and Modeling Choices in Studies on Time and Learning." *American Educational Research Journal*, 18(2), 1981, pp. 157-171.

Keith, T.Z. "Time Spent on Homework and High School Grades: A Large Sample Path Analysis." *Journal of Educational Psychology*, 74(2), 1982, pp. 248-253.

Kelly, G.P., & Altbach, P.G. "Comparative Education: Challenge and Response." *Comparative Education Review*, 30(1), 1986.

Kerr, S. "How Teachers Design Their Materials: Implications for Instructional Design." *Instructional Science*, 10, 1981, pp. 363-378.

Komoski, P. K. "What Curriculum Leaders Need to Know About Selecting Instructional Materials." Atlanta: The Annual Meeting of the Association for Supervision and Curriculum Development, 1980.

Koskenniemi, M., & Komulainen, E. "Learning Materials and the Instructional Process." *Didaktik*, No. 66, 1982, pp. 1-42.

Kulik, C.; Shwartz, B.J.; & Kulik, J.A. "Programmed Instruction in Secondary Education." *Journal of Educational Research*, 1982, pp. 133-138.

Kyei-Anti, B. *Contribution of Teachers' Resources to the Improvement of Primary Education in Ghana*. Nairobi, Kenya: ACO Project, 1983.

LaConte, R.T. *Homework as a Learning Experience (What Research Says to the Teacher)*. Washington, DC: National Education Association, 1981.

Leach, D.J., & Tunnelcliffe, M.R. "The Relative Influence of Time Variables on Primary Mathematics Achievement." *Australian Journal of Education*. Vol. 28, No. 2, 1984, pp. 26-33.

Lee, D. et al. "Successful Practices in High-Poverty Schools." *Study of the Effects of Compensatory Education on Basic Skills*, Technical Report No. 1, System Development Corporation, 1981.

Lee, J.F., & Pruitt, W.K. "Homework Assignments: Lesson Games or Teaching Tools?" *Clearing House*, 53(September), 1979, pp. 31-35.

Levin, H.M. "Clocking Instruction: A Reform Whose Time Has Come?" Stanford, CA: Stanford University Institute for Research on Educational Finance and Governance. (ERIC # ED 245 318), 1984.

Levin, H.M. "About Time for Educational Reform." *Educational Evaluation and Policy Analysis*, 6(2), 1984, pp. 151-163.

LeVine, R.A. "Influences of Women's Schooling on Maternal Behavior." *Comparative Educational Review*, June, 1980.

Lockheed, M.E. *School and Classroom Effects on Student Learning Gain: The Case of Thailand*. Paper presented at the Annual Meeting of the American Educational Research Association, Washington, DC, April 20-24, 1987.

Luna, E.; Gonzales, S.; & Wolfe, R. "The Underdevelopment of Educational Achievement: Mathematics Achievement in the Dominican Republic Eighth-Grade." Manuscript for publication, 1986.

Lyon, M.A. "Learning Rate Differences for Knowledge, Comprehension, and Application Tasks". Research report presented at the Annual Convention of the National Association of School Psychologists, Philadelphia, PA, April (ERIC # ED 252 303), 1984.

Maertens, N., & Johnson, J. "Effects of Arithmetic Homework Upon the Attitude and Achievement of Fifth and Sixth Grade Pupils." *School Science and Mathematics*, No. 72, 1972, pp. 117-126.

Mali, S.R. "A Study on Drop-Outs in Primary Schools in Pakistan: A Sample Survey." Islamabad, Pakistan: Ministry of Education, Academy of Educational Planning and Management Research Study No. 20, 1985.

Marsh, C.J. "Teachers' Knowledge of and Use of Social Studies Curriculum Materials in Public Elementary Schools." *Journal of Educational Research*, 77(4), 1984, pp. 237-243.

Martin, O., & Canty, A. "Instructional Behaviors that Enable Teachers to Maximize Allocated Classroom Time." Paper presented at the annual meeting of the Mid-South Educational Research Association in New Orleans, November (ERIC # ED 20) 580), 1980.

McDermott, R.P.; Goldman, S.V.; & Varenne, H. "When School Goes Home: Some Problems in the Organization of Homework." *Teachers' College Record*, 85(3), 1984, pp. 391-409.

McDill, E.L.; Natriello, G.; & Pallas, A.M. *Raising Standards and Retaining Students: The IMPACT of the Reform Recommendations on Potential Dropouts*. Baltimore, MD: The Johns Hopkins University, Center for Social Organization of Schools, 1985.

McDill, E.L., & Rigby, L.C. *Structure and Process in Secondary Schools: The Academic Impact of Educational Climates*. Baltimore, MD: The Johns Hopkins University Press, 1979.

McNamarra, D.R. "Attention, Time-on-Task, and Children's Learning: Research or Ideology?" *Journal on Education for Teaching*, 7(3), 1981, pp. 284-297.

Medley, D.M. "Teacher Effectiveness." *Encyclopedia of Educational Research*. 1982, pp. 1894-1903.

Mehan, H. *Learning Lessons: Social Organization in the Classroom*. Cambridge, MA: Harvard University Press, 1979.

Montero, M. (Ed.) *Bilingual Teacher Education Handbook: Strategies for the Design of Multicultural Curriculum*. Cambridge, MA: National Assessment and Dissemination Center for Bilingual and Bicultural Education, 1979.

Montero-Sieburth, M. Data collection in Costa Rican classrooms during 1983, 1986, 1987 under the auspices of the Organization of American States, the University of Costa Rica and the National University in Heredia, and Development Technologies, Inc. of Washington, D.C.

Montero-Sieburth, M. Personal communication, 1986.

Montero-Sieburth, M. "La Educacion General en Costa Rica: La Aplicacion del Curriculum." Informe Especial del Proyecto de Asistencia Tecnica, Banco Mundial/Ministerio de Plainficacion, Prestanio 2509, Componente No. 4, April 1988.

Montero-Sieburth, M., & Loera-Vaerla, A. Participant observation of Guatemalan classrooms under the auspices of BRIDGES Project, Harvard University, August 1986.

Moore, J.E. "Assessing Time-on-Task: Measurement Problems and Solutions." Paper presented at the Joint Meeting of the Evaluation Network and Evaluation Research Society, Chicago, (ERIC # ED 237-574), October 20, 1983.

Moore, J.E. "Measuring and Increasing Time-On-Task: A Cost Effective Approach." Paper presented at the Annual Meeting of the American Educational Research Association, Chicago, Illinois, 1985.

Mudjiman, H. "Effectiveness of Learning Modules and Peer Tutors in Student Learning." *Teaching Yourself in Primary School: Report on a Seminar on Self-Instructional Programs*. Ottawa, Canada: International Development Research Centre, 1981, pp. 81-91.

Mueller, D.J. "Mastery Learning: Partly Boon, Partly Boondoggle." *Teachers' College Record*, No. 78, 1976, pp. 41-52.

Munoz-Izquierdo, C., et al. "El Sindromo del Atraso Escolar y el Abandono del Sistema Educativo." *Revista Latinoamericana de Estudios Educativos*, 9(3), 1979, pp. 1-60.

Neumann, P.H. "Publishing for Schools, Textbooks and the Less Developed Countries." Staff Working Paper No. 398, Washington, DC: World Bank, 1980.

Neumann, P.H., & Cunningham, M.A. *Mexico's Free Textbooks, Nationalism and the Urgency to Educate*. Staff Working Papers, Washington, DC: World Bank, No. 541, 1982.

Nichols, D.G. "Low Cost Learning Systems: The General Concept and Some Specific Examples." *NSPI Journal*, September, 1982, pp. 4-8.

Noli, P. "A Principal Implements an ALT Program." *Journal of Classroom Interaction*, 17(2), 1979, pp. 22-27.

Oaskeshott, P., & Bradley, C. (Eds.). *The Future of the Book, Part I, The Impact of New Technology*. Report prepared by the Publishers Association. Paris: UNESCO, 1982.

Pascal, R.A.; Weinstein, T.; & Walberg, H.J. "The Effects of Homework on Learning: A Quantitative Synthesis." *Journal of Educational Research*, 78(2), 1984, pp. 97-104.

Pearce, D. *Textbook Production and Developing Countries: Some Problems of Preparation, Production and Distribution*. Paris: UNESCO, 1982.

Pendergrass, R.A. "Homework: Is It Really a Basic?" *The Clearing House*, 58 (March), 1985, pp. 310-314.

Peterson, P.L., & Clark, C.M. "Teachers' Reports of Their Cognitive Processes During Teaching." *American Educational Research Journal*, No. 15, 1978, pp. 417-432.

Peterson, P.L.; Swing, S.R.; Stark, K.D.; & Waas, G.A. "Students' Cognitions and Time-on-Task During Mathematics Instruction." *American Educational Research Journal*, 21(3), 1984, pp. 487-515.

Phi Delta Kappa. *Time and Learning*. Bloomington, IN: Center on Evaluation, Development and Research, 1983-84. (Comprehensive review of reviews on time-on-task, includes the work of Nancy Karweit, David Berliner, Torsten Husen, Barak Rosenshine, Deborah Strother and others).

Philips, S.U. *The Invisible Culture: Communication in Classroom and Community on the Warm Springs Indian Reservation*. New York: Longman, 1983.

Potar, N. "Project RIT." Lapduri, Thailand: Project RIT, Muang Mai School, 1984.

Prondvost, G. "Time in a Sociological and Historical Perspective." *International Social Science Journal*, 107, 1986.

Report to the National Research Council Commission on Behavioral and Social Sciences and Education. "Non-Cognitive Factors in Education." La Jolla, CA: University of California, San Diego, 1980.

Robinson, J.P. *How Americans Use Time: A Sociological-Psychological Analysis of Everyday Behavior*. New York: Praeger Publishers, 1977.

Rosenshine, B., & Berliner, D.C. "Academic Engaged Time." *British Journal of Teacher Education*, 4, 1, 1978, pp. 3-16.

Rosenshine, B.V. "Content, Time and Direct Instruction." *Research on Teaching, Concepts, Findings and Implications*. Berkeley: McCutcheon Publishing Corporation, 1979, pp. 28-56.

Rowe, M.B. "Wait-Time and Rewards as Instructional Variables, Their Influence on Language, Logic and Fate Control: Part One - Wait-Time." *Journal of Research on Science Teaching*, No. 11, 1974, pp. 81-94.

Roy, A. "Schools and Communities: An Experience in Rural India." *International Review of Education*, 36(3), 1980, pp. 369-378.

Safilios-Rothschild, C. "Access of Rural Girls to Primary Education in the Third World: State of the Art, Obstacles and Policy Recommendations." Washington, DC: Department of State, United States Agency for International Development, 1979.

Sanford, J.P., & Evertson, C.M. "Time Use and Activities in Junior High Classes." *Journal on Educational Research*, 76(31), 1983, pp. 140-147.

Sanguinety, J. "La Educacion General en Costa Rica: La Crisis y sus Posibles Soluciones." Final report to Ministry of Planning, World Bank Project, 2519. Componente No. 4, Development Technologies, Inc., San Jose, Costa Rica. March, 1988.

Schiefelbein, E.; Farrel, J.; & Sepulveda-Stuardo, M. "The Influence of School Resources in Chile: Their Effect on Educational Achievement and Occupation." Washington, DC: World Bank, Staff Working Paper No. 538, 1983.

Schiefelbein, E., & Simmons, J. "The Determinants of School Achievement: A Review of the Research for Developing Countries." Ottawa: International Development Research Centre, 1981.

Searle, B. W., & Mertaugh, M., with Read, A. & Cohen, P. *Improving the Quality of Textbooks in China*. World Bank Discussion Papers, Washington, DC: World Bank, 1988.

Seifert, E.H., & Beck, J.J. "Time/Learning Relationships in Secondary Schools: A Research Report." Available through ERIC: ED #229 853.2, 1983.

Seifert, E.H., & Beck, J.J. "Relationships Between Task Time and Learning Gains in Secondary School." *Journal of Educational Research*, 78(1), 1984, pp. 5-10.

Shulman, B. "Those Who Understand: A Conception of Teacher Knowledge." *American Educator*, 10(1), 1986.

Slavin, R.E. "Cooperative Learning." *Review of Education Research*, 50(2), 1980, pp. 315-342.

Smith, E.C. *Longer School Years: Reform or Illusion?* Washington, DC: LEARN, Inc., The Education Foundation (ERIC # ED 247 661), 1983.

Smith, J.W. "Pupil Engaged Learning Time: Concepts, Findings and Implications." Victoria, Australia: Deakin University, School of Education Occasional Paper, 1979.

Smith, L.M., & Geoffrey, W. *The Complexities of an Urban Classroom*. New York: Holt, Reinhart and Winston, 1968.

Smith, N.M. "The Relationship Between Time Allotted to Social Studies and Student Achievement in Fifth-Grade Classes of a Tri-County Area of Southern Maryland." Unpublished doctoral dissertation, University of Maryland. *Dissertations Abstracts Internationals*, 1978 28:327 A (University Microfilms No. 77-26, 539.) 1976.

Smith, N.M. "Time Allotments and Achievement in Social Studies." Unpublished manuscript. Baltimore, MD: Johns Hopkins University, John F. Kennedy Institute for Abilitation, 1976.

Smith, N.M. "Allocation of Time and Achievement in Elementary Social Studies." *Journal of Educational Research*, 72(4), 1979, pp. 231-236.

Smyth, W.J. "Research on Classroom Management: Studies of Pupil Engaged Learning Time as a Special but Instructive Case." *Journal of Education for Teaching*, 7(2), 1981, pp. 127-148.

Smyth, J.W. "A Context for the Study of Time and Instruction." In C.W. Fisher and D.C. Berliner (Eds.), *Perspectives on Instructional Time*. New York: Longman, 1985a.

Smyth, J.W. "Time and School Learning." *International Encyclopedia of Education*, 9. New York: Pergamon Press, 1985b, pp. 5265-5272.

Stallings, J.A. *Findings from the Research on Teaching: What We Have Learned*. Nashville, TN: Peabody Center for Effective Teaching, Peabody College at Vanderbilt University, 1983.

Stallings, J.A. "Instructional Time and Staff Development: How Useful is Research on Time to Teachers?" In C.W. Fisher and D.C. Berliner (Eds.), *Perspectives on Instructional Time*. New York: Longman, 1985, pp. 283-299.

Stark, J.S.; Lowther, M.A.; & Austin, A.E. "Teachers' Preferred Time Allocation: Can it be Predicted?" *Journal of Experimental Education*, 53(3), 1985, pp. 170-183.

Steere, R.F., & Wiley, R.C. "Using Time-on-Task to Supervise and Improve Instruction." Paper presented at the Annual Meeting of the Association of Teacher Educators, Las Vegas, NV, February 17-20 (ERIC # ED 254-910), 1985.

Stevenson, H. "Comparison of Japanese, Taiwanese and American Mathematics Achievement." Stanford: Center for Advanced Study in the Behavioral Sciences, 1983.

Stevenson, H. "Making the Grade: School Achievement in Japan, Taiwan and the United States." Stanford, CA: Center for Advanced Study in the Behavioral Sciences (ERIC # ED 256 823), 1983.

Strother, D.B. "Another Look at Time-on-Task". *Phi Delta Kappa*, June, 1984.

Tamir, P. "Homework and Science Learning in Secondary Schools." *Science Education*, 69(5), 1985, pp. 605-615.

Thailand, Ministry of Education. "Classroom Environment Study Report. Phase One: The Correlational Study." Bangkok: Ministry of Education, Department of Teacher Education, 1985.

Thailand, Office of the National Education Commission, Office of the Prime Minister, Bangkok *Determinants of Effective Schools: Thailand Country Review*. Cambridge, MA: Education Development Discussion Paper No. 1, Harvard University, Project BRIDGES, 1988.

Thiagarajan, S., & Paigna, A. *Literature Review on the Soft Technologies of Learning*. Cambridge, MA: Research Report Series No. 2, Harvard University, Project BRIDGES, 1988.

Thomas, J.A. *The Productive School: A Systems Analysis Approach to Educational Administration*. New York: Wiley, 1971.

Tikunoff, W., & Ward, B. *Some Selected Findings from Three Studies*. San Francisco, CA: Far West Laboratory for Educational Research and Development, 1976.

Tobin, K.G. "The Effect of Extended Teacher Wait-Time on Science Achievement." Resources Information Center (ERIC # ED 171 577), 1979.

UNESCO. "Universalizing Education: Strategies for the Development and Use of Instructional Materials." Bangkok: Regional Office for Education in Asia (ERIC # ED 182 061), 1979.

UNESCO. "Education of Disadvantaged Groups and Multiple Class Teaching: Studies and Innovative Approaches." Bangkok: Regional Office for Education in Asia and the Pacific, 1980.

UNESCO. "The Dropout Problem in Primary Education: Towards Universalization of Primary Education in Asia and the Pacific - Some Case Studies." Bangkok: Regional Office for Education in Asia and the Pacific, 1984.

Vazquez, J. Z. *Nacionalismo y Educacion en Mexico*. Mexico, D.F.: El Colegio de Mexico, 1979.

Wang, M.C. "An Analysis of Program Design Implications for Teacher and Student Use of School Time." In C.W. Fisher and D.C. Berliner (Eds.), *Perspectives on Instructional Time*. New York: Longman, 1985.

Wiley, D. "Another Hour, Another Day: Quantity of Schooling, a Potent Path for Policy." In W. Sewell, R. Hauser & D.L. Featherman (Eds.), *Schooling and Achievement in American Society*. New York: Academic Press, 1976.

Wiley, D., & Harnischfeger, A. "Explosion of a Myth: Quantity of Schooling and Exposure to Instruction, Major Educational Vehicles." *Studies of Educational Processes*, Report 8. Chicago, IL: University of Chicago, 1974.

Windham, D.M. "Internal Efficiency and the African School." Paper prepared for the IREDU, University de Dijon, France, 1985, Mimeo.

Wolf, R.M. "Achievement in the United States." In H.J. Walbert (Ed.), *Educational Environments and Effects: Educational Policy and Productivity*. Berkeley, CA: McCutcheon, 1979.

The World Bank. *Education: Sector Policy Paper*. Washington, DC: World Bank, 1980.

The World Bank. *Education Strategies for Sub-Saharan Africa*. Washington, DC: World Bank, 1986.

Yeager, J.L., & Lindvall, C.M. "An Exploratory Investigation of Selected Measures of Rate of Learning." *Journal of Education*, No. 36, 1967, pp. 78-81.

Zeigler, S. "The Effectiveness of Classroom Learning Teams for Increasing Cross-Ethnic Friendships: Additional Evidence." *Human Organization*, 48, 1981, pp. 264-268.

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**Improving Primary Education
in Developing Countries:
A Review of Policy Options**

by

Marlaine E. Lockheed and Adriaan Verspoor

with

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**Education and Employment Division
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Chapter IV. IMPROVING THE PREPARATION AND MOTIVATION OF TEACHERS

The Need for More and Better Teachers

199. Teaching quality and teaching time are key determinants of student achievement. As one professional teaching organization notes:

The fundamental requirements for proficient teaching are relatively clear: a broad grounding in the liberal arts and sciences; knowledge of the subjects to be taught, of the skills to be developed and of the curricular arrangements and materials that organize and embody that content; knowledge of general and subject-specific methods for teaching and for evaluating student learning; [and] knowledge of students and human development...^{216/}

Yet, the teaching force in many developing countries fails to meet these standards. Prospective teachers lack adequate general academic preparation; both new and experienced teachers lack many pedagogical skills; and low motivation and commitment to the profession are prevalent. Chapter III discusses strategies for improving the knowledge and teaching practices of incumbent teachers. This chapter discusses strategies for improving the knowledge and skills of new teachers and the motivation of all teachers.

200. The challenge faced by governments and teacher training institutions is large. The preparation, training and continued training of primary teachers involve vast numbers of individuals. Education is the single largest modern wage sector employer in the world, with the primary education sector employing over 19 million teachers worldwide, 8.7 million of whom are in low-income countries. Moreover, it is a profession that is likely to increase dramatically in the next decade, particularly in the low-income countries. Projected growth in school-age populations will require preparation and employment of hundreds of thousands of additional primary school teachers just to maintain current levels of enrollment. Increasing primary school coverage to 100 percent gross enrollments by the year 2000 would necessitate the preparation of about 4.5 million teachers in low-income countries (other than China and India), 1.8 million more than would normally be produced, given existing growth, current student-teacher ratios, and nominal (3 percent) attrition rates. Another 6 million teachers will be needed in middle-income

^{216/} National Board for Professional Teaching Standards (1989). Toward High and Rigorous Standards for the Teaching Profession. Author.

countries, but -- in these countries -- existing growth and 3 percent attrition rates yield nearly 6.5 million more teachers than are needed.^{217/}

Table 4.1: Number of new teachers, required in year 2000 to achieve 100% gross enrollment, by GNP per capita (in '000s)

GNP per capita	Estimated 6-11 year old population (2000)	Current teaching force (1985)	Teachers needed at current Stud/Tchr. Ratio (2000) ^{a/}	Additional teachers (unadjusted for attrition)	Additional teachers (with 3% adjust. for attrition) ^{b/}
Low (w/o C & I)	154,448	1,421	3,965	2,238	4,534
China and India	268,314	7,244	8,335	1,091	5,918
Lower middle	136,570	3,542	4,421	878	3,438
Upper middle	118,335	3,778	3,956	178	2,469

Source: Annex Tables 1 and 9.

- a/ The number of teachers required was based on fixed student teacher ratios, with the figure based on the sum of individual country projected 6-11 population divided by current student: teacher ratio.
- b/ The 3 percent attrition is a minimum figure based on mortality rates, and may underestimate the actual figure. Numbers were determined using the equation:

$$P = I(1-a)(1+r)^t \text{ where } P = \text{projection}; I = \text{Current number of teachers}; a = \text{the attrition rate}; \text{ and } r = \text{the rate of growth needed to fulfil future teacher requirements } (P/I)^{1/t} - 1 \text{ where } t = 15.$$

201. To avoid producing new teachers having the same inadequate skills and professional commitment as many incumbent teachers, it will be necessary to design policies directed at (i) improving the knowledge level of prospective teachers, (ii) increasing the pedagogical skills of new teachers,

^{217/} Projected supply figures of teachers were estimated from aggregate growth rate in the teaching force (Annex Table 9) between 1980-1985, and extended to 2000. It is assumed that current production will be maintained through to the year 2000. The aggregate output rates used were: low income = 2 percent (7 percent without China and India); lower middle = 5 percent; and upper middle = 3 percent. The results show a production "shortfall" of 1.8 million teachers in low-income countries, but a production "excess" of 2.6 million teachers in lower middle-income countries and 3.9 million in upper middle-income countries. This excess production may include untrained teachers, however.

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Table 4.1: Number of new teachers required in year 2000 to achieve 100% gross enrollment, by GNP per capita (in thousands)

GNP per capita	Estimated 6-11 year old population (2000)	Current teaching force (1985)	Teachers needed at current stud/tchr. ratio (2000)	Additional teachers (unadjusted for attrition)	Teachers lost at 3% attrition	Additional teachers (with 3% adjust. for attrition)
Low (w/o C & I)	154,448	1,727	3,965	2,238	1,076	3,314
China and India	268,314	7,244	8,335	1,091	3,473	4,564
Lower middle	136,570	3,543	4,421	878	1,756	2,635
Upper middle	118,335	3,778	3,956	178	1,725	1,902

and (iii) improving teacher motivation. To improve the knowledge and skills of new teachers requires changes in recruitment practices and preservice training; to improve teacher motivation requires restructuring of incentives for performance. Low teacher competence and poor motivation reflect what is a problem encountered by the teaching profession in many countries: poor status.

202. Status plays an important role in attracting academically prepared candidates, and in retaining them in the profession. Status is based on the perception by society and prospective teachers of: (a) the extrinsic levels of compensation and conditions of the work-place, and (b) the intrinsic rewards of professional accomplishment.

203. Historically, teaching was held in high regard as a profession--in Korea for example, the teacher was honored equally with the king and the parent.^{218/} But present-day primary school teaching lacks that same status, and has even declined considerably in the last two decades.^{219/} This low status -- manifest in low salaries, poor working conditions and uncertain career paths -- means that the most able students avoid teaching as a career; they either enter higher levels of general education or pursue occupations in the private wage and public administration sectors, which offer more competitive salaries and promotion prospects.^{220/} In countries experiencing rapid expansion of their education systems, underqualified applicants are recruited to meet the growing demand for teachers; this further lowers the public perception of the occupation's prestige. This compounds the situation, wherein the primary level teaching profession neither attracts nor retains the best qualified and most motivated individuals.

204. Occupational choice by students is a good indicator of their perception of a profession and their motivation to enter it. Evidence suggests that teaching is seldom the first occupational choice of students, even those enrolled in teacher training programs. A survey in Turkey, for instance, found that only 5 percent of all students admitted into primary teacher training programs at universities indicated that teaching was among the top three occupations to which they aspired.^{221/} This survey also showed that the relative desirability of teaching has dropped significantly between 1982 and

^{218/} IEES Improving the Efficiency of Educational Systems Project (1986). Indonesia Education and Human Resources Sector Assessment. Tallahassee, Florida: Florida State University; APEID Asian Programme of Educational Innovation for Development (1984). Towards Universalization of Primary Education in Asia and the Pacific: Republic of Korea. Unesco Regional Office for Education in Asia and the Pacific, Bangkok: UNESCO

^{219/} D. Warren (1990, forthcoming). American Teachers: Histories of a Profession at Work. Macmillan

^{220/} Except in highly centrally planned and administered economies such as China.

^{221/} K. Murray (1988). Profile of the new generation of teachers in the Turkish education system. International Review of Education. 34 (1): 5-15.

1986 (see Table 4.2). In Liberia, three-fourths of surveyed teacher candidates reported that they foresaw no other job possibility -- so they settled for entry into a teacher training program.^{222/} In Zimbabwe, only 2 percent of surveyed Form IV pupils expressed a desire to enter primary teacher training. The majority had aspirations for higher education.^{223/}

Table 4.2: Turkey - Percent of university exam pupils who report that teaching is among top three preferred occupations

Year	Males	Females
1982	9%	16%
1986	4%	7%

Source: Murray (1988).

205. Although governments cannot typically alter the national labor markets in which they must seek candidates, they can alter the conditions of the teaching profession, to improve its standing within those markets and hence accord it higher status. Raising the status of teaching will significantly strengthen the capacity of governments to recruit more competent prospective teachers. By giving the teaching profession high attention, governments can increase public awareness of its importance, at very little cost. Political leaders can do much to emphasize the intrinsic benefits of service to society and professional growth which teachers themselves associate with primary school teaching. Governments in Zimbabwe and Nicaragua, for example, have made concerted efforts to highlight the value and importance of working within the teaching service.^{224/} Box 4.1 describes Zimbabwe's program to attract and retain qualified teachers. At the same time, improving the

^{222/} Ministry of Education, Liberia (1989). Teacher Incentives Study. Monrovia.

^{223/} B. Chivore (1986). Pupils attitudes to teaching in Zimbabwe. Comparative Education 22 (3): 232-253.

^{224/} Report on the Conference of Commonwealth Education Ministers and Commonwealth Secretariat (9th: 1984: Nicosia). Commonwealth Secretariat: London; C. MacAdam (198). Towards Democracy: The literary crusade in Nicaragua. International Review of Education. 30 (3): 359-368.

**Box 4.1: Recruitment Incentives:
Zimbabwe's Integrated Teacher Education Course (ZINTEC)**

Governments are confronted with the problem of recruiting sufficient teachers to meet their education objectives. Zimbabwe's Integrated Teacher Education Course (ZINTEC) is a good example of a program that both attracts and retains new teachers.

The introduction of free primary education in the wake of independence created an unprecedented rise in the number of children attending primary school in Zimbabwe. Primary school enrollments increased from 800,000 in 1980 to over 2,000,000 by the end of 1982. To meet this demand, the teaching corps was increased from 21,000 to 54,000 by 1983. About 15,000 of these teachers were untrained. A four-year sandwich program was introduced to rapidly expand and train this teaching force. Students attend a 16-week residential course, followed by ten terms of teaching, and finish with another 16-week residential course. During the period of on-the-job training, students continue their studies through correspondence courses and are assessed in class by visiting monitors. By 1986, over 8,000 students had graduated from the program from eleven intakes at four colleges.

The program emphasizes non-financial incentives. During the out-placement period, students are deployed in clusters of three or more per school, in order to encourage their interaction, maintain their enthusiasm, and facilitate school-based tutorials. The course curricula emphasize community projects -- the construction of Blair toilets in rural villages being a notable example -- which helps the teacher play a pivotal role in community affairs. The ZINTEC project is seen as a shining example of "Zimbabweanization," a home-grown success. The emphasis on sacrifice and self-reliance, coupled with the abandonment of learning as a privileged commodity, has benefitted the teaching profession as a whole, and inspired the flow of new applicants to the profession.

Substantive material and professional inducements are also used to encourage participation in the program. Tuition, food and lodging are provided free during the residential courses, and correspondence materials are provided free during the period of out-placement. A stipend is paid to every student when she/he joins the program, and is increased as various parts of the cycle are completed, so that, on graduation, the student receives the standard salary of a certified primary school teacher. In return the students are bound to serve the government for a period of three years after graduation.

Sources: D. Sibanda (1982) The Zimbabwe Integrated Teacher Education Course INSET, Bristol, England: Bristol University School of Education.; B. Gatwa (1986) ZINTEC in C. Treffgarne Education in Zimbabwe London University Department of International and Comparative Education, Occasional Paper No. 9.

status of teaching requires policies that improve the competence of prospective teachers, enhance their skills and improve the conditions under which they must work.

General Academic Background

206. A first determinant of teaching effectiveness is the general academic preparation of the teacher. Yet, in most developing countries, prospective teachers have acquired only about nine years of general education (Table 4.3) and often do not represent the academically strongest among their classmates.

Incomplete secondary-level academic preparation

207. Prospective primary teachers in developing countries typically have not completed secondary education, although most (two-thirds) developing countries reporting data in 1988 required teacher candidates to have completed some upper-secondary education and the minimum years of formal education required prior to entering teacher preparation programs has risen in many countries.^{225/} For example, in Togo, only 33 percent of all primary school teachers had completed lower-secondary school, plus three additional years of either general secondary school or a teacher preparation program in 1970; the proportion meeting this standard had risen to 77 percent by 1988. In India, 75 percent of all primary teachers had completed lower-secondary plus three years in 1970; the share rose to 88 percent by 1988.^{226/}

Table 4.3: Mean number of years of schooling as prerequisite to teacher training in 60 countries, by GNP per capita

GNP per capita	Pre-training Schooling
Low	9.3
Lower middle	9.8
Upper middle	9.4

Source: Gimeno & Ibanez (1981); Zymelman & DeStefano (1989); Cameron, Cowan, Holmes, Hurst (1983).

^{225/} UNESCO (1988). Joint ILO/UNESCO Report of the Committee of Experts on the Application of the Recommendation Concerning the Status of Teachers. Geneva: UNESCO.

^{226/} UNESCO (1988).

208. In countries with high rates of population growth, rapid expansion of the primary education system has necessitated reducing the length of general education attained prior to entry into teacher training. For example, in one west African country in the early 1980s, children were recruited into teacher training courses at the age of 11-12.^{227/} Crash preservice programs have been mounted, and temporary teachers, often with no more than lower-secondary schooling, have been hired as "unqualified teachers". The result is that in some countries, many teachers lack formal certification of any sort. For example, in 1986, 46 percent of primary teachers in Zimbabwe were classified as unqualified.^{228/} In Nigeria, only 9 percent of the primary teachers in Kano State had formal teacher certification.^{229/} Another study noted that fewer than 10 percent of primary teachers in Haiti were qualified^{230/} and less than 30 percent were trained. In Liberia, only 47 percent of teachers had received teacher training.^{231/} Historical practices, where upper primary school "graduates" taught in the lower primary school and junior secondary "graduates" taught in upper primary school, have reinforced the problems. It is only when there is a general high level of education attained by sufficient numbers of students that such practices can be discontinued. Some middle income countries are reaching this stage.

209. The decline in the academic preparation of prospective teachers results in teacher trainees who lack the intellectual and academic skills to perform well in training; and, because of weak preparation, teacher training must concentrate on ensuring sound curriculum content knowledge, to some extent at the expense of time that is urgently needed for developing pedagogical skills.

^{227/} J. Urwick (1987). Improving the qualifications of primary school teachers in Nigeria: Official goals and practical possibilities. Compare 17 (2): 137-157.

^{228/} B. Dorsey (1989). Educational development and reform in Zimbabwe. Comparative Education Review 33 (1): 40-58.

^{229/} C. Harber (1984). Schooling for bureaucracy in Nigeria. Journal of Educational Development. 4 (2): 145-154. According to World Bank data, this proportion had increased to 14 percent by 1989.

^{230/} IEES Improving the Efficiency of Educational Systems Project Sector Study (1987). Haiti. Tallahassee, Florida: Florida State University.; In Haiti, "qualified" teachers have completed a teacher training school program or its equivalent. "Training" teachers refers to the upgrading of skills of current teachers through inservice programs.

^{231/} F. Kemmerer and S. Thiagarajan (1989). Teachers Incentive Systems: Final Report. Tallahassee, Florida: Florida State University.

Poor academic accomplishment

210. Because prospective teachers lack complete secondary education, they may lack the knowledge necessary to be effective teachers, and this may be a problem that is growing. There is some evidence that the general educational competence of prospective teachers has fallen, even among those who have completed secondary school. One explanation for this may be that the expanded access to secondary education has skewed academic results downward. The lower average grades for applicants reflects the fact that prospective teachers generally attain lower grades in their graduating class. One study found a "decline in average secondary school rank" and a "downward shift in average educational achievement" of prospective teachers.^{232/} In Turkey, for instance, the mean grade point average of secondary school completers who were prospective teachers dropped significantly from 1982 to 1986 (Table 4.4). And anecdotal evidence suggests that those who choose to enter teacher training are among the least able of their classmates. For example, in China, students accepted into post-secondary "normal" schools are among the poorest performing students who attend post-secondary institutions.

211. Part of the reason may be found in the inefficiencies of the selection process. Education ministries typically receive many applications for a scarce number of places within teacher training programs. The process of checking applicants' qualifications and conducting interviews can take many months, and by the time selections are made, many applicants drop out of the process with many top applicants undoubtedly taking university places or pursuing other options.

Table 4.4: Turkey: Comparison of high school grade-point averages of students entering teacher-training.

GPA	1982	1986
61-80	33%	13.3%
41-60	56%	81%

Source: Murray (1988).

Policy Options

212. Most training for primary teachers in developing countries takes place at the secondary level, lasts from two to four years (Table 4.5), and replicates in large measure the curriculum content of general secondary school. The costs involved in providing this type of general education,

^{232/} V. Rust (in press). In V. Rust and P. Dalin (Eds.) Teachers and Teaching in the Developing World: 6, 13.

however, are staggering. Significant savings could be obtained by requiring prospective teachers to obtain their general secondary education in general secondary schools.

213. According to the most recent Unesco statistics, in 42 percent of responding countries, primary teacher training takes place only at the secondary level.^{233/} One study of teacher training in developing countries noted that of 19 low and middle-income countries, 11 had primary teacher training programs that required only 9 or fewer years of general education as a prerequisite; these teacher training programs, therefore, began at the same level as upper secondary school. Two-thirds of the programs studied involved courses that lasted three or more years for a duration approximately equivalent to secondary school.^{234/}

Table 4.5: Average length of teacher training in 60 countries, by GNP per capita

GNP per capita	Length of teacher training
Low	2.6
Lower middle	2.7
Upper middle	3.4

Source: Gimeno & Ibanez (1981); Zymelman & DeStefano (1989); J. Cameron, R. Cowan, B. Holmes, P. Hurst and M. McLean (1983). International Handbook of Education Systems. J. Wiley and Sons: New York, NY. (3 vols).

214. Moreover, as much as 86 percent of the curricular content of teacher training replicates that of general secondary education (Table 4.6).^{235/} In three countries for which recent data are available (Somalia, Thailand and Yemen Arab Republic), less than 15 percent of the curriculum was devoted to developing pedagogical skills and 5 percent or less to practice teaching; the remainder addressed general academic subjects.^{236/} Using teacher training as a substitute for general secondary education for improving teachers' preservice

^{233/} UNESCO (1988). Table III.

^{234/} J. Gimens and R. Ibanez (1981) The Education of Primary and Secondary School Teachers. Paris: UNESCO.

^{235/} Z. Ghani (1980). Pre-service teacher education in developing countries. In Rust and Dalin (Eds).

^{236/} IEES Project Sector Studies. Yemen Arab Republic, Malaysia, Somalia.

academic preparation is both costly and detracts from the development in prospective teachers of a wide range of pedagogical skills.

Table 4.6: Curriculum content of primary teacher training programs in selected countries

Country	Length of Program in years	Percent		
		General Education	Professional Theoretical	Practice Teaching
Ecuador	2	39	40	21
India	2	40	40	20
Lesotho	3	--	--	33
Malaysia	2	73	8	19
Morocco	1	80	10	10
Singapore	2	64	29	15
Somalia	2	86	11	3
Thailand	2	84	13	3
Yemen Arab Republic	5	80	14	5

Source: Gimens and Ibanez (1981); IEES studies; Z. Ghani (1985).

215. In comparison with general secondary education, teacher training is quite expensive, ranging from 1.5 to 10 times the annual per student cost of general secondary (Table 4.7). While differences in expenditures might be justifiable if the curricula were substantially different (e.g. teaching pedagogy), or if particularly high levels of material inputs were required, it cannot be justified when the curriculum content is quite similar. The high direct costs reflect the tendency of teacher training programs to be residential, requiring stipends for food and lodging, and for teacher trainees to receive a salary while in training. The social costs of teacher training can also be high when those who enter the program do not become teachers, but rather use the certificate as a key to further education or alternative employment. The advantage of shifting the substantial general education part of current primary teaching programs to the secondary school system are therefore twofold: (i) lower costs for the general education component of the programs, and (ii) the concentration of scarce teacher training resources on shorter, well-focused pedagogical training programs.

Table 4.7: Per pupil cost of teacher-training as multiple of general secondary education in selected countries (in current domestic currencies)

Country	Unit costs of teacher training as a multiple of general secondary.
<u>Low-income</u>	
Bangladesh	1.64
Cape Verde	9.07
Central African Republic	9.07
China	8.51
Gambia	10.43
Ghana	2.96
Guinea-Bissau	6.55
Haiti	6.31
Madagascar	8.60
Mali	12.82
Malawi	3.07
Mauritania	4.61
Nepal	2.65
Pakistan	25.53
Seychelles	0.53
Somalia	0.87
Swaziland	4.28
Tanzania	4.11
Tonga	34.67
Zambia	3.25
<u>Lower middle-income</u>	
Botswana	2.83
Dominican Republic	8.68
Guatemala	1.36
Indonesia	1.10
Liberia	10.12
Nicaragua	3.81
Nigeria	3.21
Average ratio	7.06

Note: Figures for Nigeria represent State, and not Federal, institutions.

Source: UNESCO Statistical Yearbook 1988, Tables 3.5 and 4.3; Improving the Efficiency of Educational Systems (IEES) series funded by USAID; J. Tilak (1989). Financing and Cost Recovery in Social Sectors in Malawi. World Bank; C. Benson (1985). Nigeria: Education Sector Expenditure Review. World Bank.

216. Provide general education in general secondary schools. First, since annual per student costs for general secondary schools are significantly lower than those for teacher training schools, teachers could receive their preservice general subject matter training in general secondary schools at a lower unit cost. While introducing a cost-recovery system for the students could lower the net costs associated with stipends, it could provide a disincentive for some students, such as the rural poor, to enter training. Shifting the general education component of teacher training to general secondary schools could also lower social costs of training by reducing the likelihood that teacher certification would be used as a route to non-teaching employment or further education. And lengthening the general education of prospective teachers could ensure that they have the capacity to perform well in training.

217. Shorten teacher training. Second, the length of teacher training programs could be shortened and more narrowly focused on providing appropriate pedagogical skills; this would reduce costs of producing a teacher still further. Since less than 25 percent of teacher training curricula in many countries is devoted to teaching prospective teachers how to teach, the implication is that the length of these programs could be cut by 75 percent with no loss of instructional time in this area.

Pedagogical Skill Development

218. The lack of pedagogical skills among incumbent teachers is discussed in Chapter III. One reason that new teachers are deficient in pedagogical skills is that the attention paid to general academic education during teacher training detracts significantly from the time available for pedagogical skill development. The long term impact is on the limited capacity of the teacher to deal creatively with the pedagogical challenges of the classroom.

219. Objectives. Research clearly demonstrates that teachers with a wide repertoire of teaching skills are better able to teach than those with only a limited repertoire.^{237/} Effective preservice training needs to build upon a sound curriculum content knowledge and provide training in pedagogical methods, while encouraging practice teaching under the supervision of an experienced and capable teacher.

220. Achieving this level of proficiency requires not only subject matter competence but also an understanding of how to effectively transmit knowledge. Teachers must be able "to comprehend subject matter for themselves [and then become] able to elucidate subject matter in new ways, recognize and partition it, clothe it in activities and emotions, in metaphors and exercises, and in

^{237/} Fuller (1987); Haddad (1985).

examples and demonstrations, so that it can be grasped by students."^{238/} The goal of teacher education is not to indoctrinate teachers to behave in rigid and prescribed ways but to encourage teachers to reason about the way they teach and why they are teaching that way. Teachers need to comprehend both the subject content and pedagogical skills necessary to follow in order to promote the exchange of ideas. These pedagogical skills include, for example, classroom management and organization, appreciation of student characteristics and preconceptions, formal and non-formal student evaluation, personal reflection and critical self-analysis.

221. Content of teacher training. Unfortunately, most preservice teacher training does not do enough to develop these skills. First, most time is spent on general academic courses, as mentioned previously. Second, even the remaining time is poorly used. Classes focus on broad theoretical issues, not on the specific types of strategies that can be successfully employed by teachers to enhance their students' comprehension (see Table 4.8) or they provide only a limited range of pedagogical skills. The sorts of skills identified in Chapter III as those that enhance student achievement -- asking children questions, checking children's comprehension, or providing feedback -- are neglected. Third, the preparation of the teacher educators is such that they themselves lack the skills to effectively train teachers. In Nigeria, only 30 percent of 4,500 instructors in primary teacher training institutions in twelve states had an undergraduate degree in primary teaching training.^{239/} In Zambia, reportedly only 20 percent of the instructors were more qualified than their students and 9 percent were actually less qualified.^{240/}

Policy Options

222. In many countries, teacher training provides few teaching skills. Over a two to three year period, less than 25 percent of training is devoted to developing teaching skills, and teachers often perpetuate the poor practices of teachers in the schools to which they are ultimately assigned. Three options are available for improving pedagogical skills on the base of a starting level of good secondary education: (i) revise entry-level standards, (ii) emphasize pedagogical skill development, and (iii) expand practice teaching. For incumbent teachers, providing pedagogical support through improved supervision and principal advice is also important; this is discussed in Chapter V.

^{238/} Shulman (1987). Knowledge and teaching: foundations of the New Reform. Harvard Educational Review, 57 (1): 13.

^{239/} World Bank (1989).

^{240/} Kelly, Nkwanga, Kaluba, Achola and Nilsson (1986). The Provision of Education for All: Towards the Implementation of Zambia's Educational Reforms Under Demographic and Economic Constraints. University of Zambia. (processed).

Table 4.8: Comparison of pedagogical training instruction in teacher training colleges in three countries.

three year Subject	Haiti	Yemen	Nepal
	average hours/week five year course	average hours/week two year course	total credit course
Academic Training	17.7 (53)	25.4 (70)	General: 500 Special: 1050 (86)
Pedagogical Training	7.7 (23)	5.4 (15)	150 (8)
Introduction to education	-	-	50
Philosophy of education	1	-	-
Professional ethics	-	-	-
General pedagogy	1	-	-
History of education	0.3	1.2	-
Theories of education	0.3	-	-
Psychology	2.3	1.2	100
General didactics	1	-	-
School administration	1	-	-
Special pedagogy	0.7	-	-
Methods of teaching	-	1.8	-
Instructional materials	-	1.2	-
Student Teaching	-	2 (5)	100 (6)
Social Education	3.3 (10)	-	-
Practical Training ^{a/}	4.7 (14)	3.8 (10)	
Total	33.3 (100)	36.6 (100)	1800 (100)

Source: IEES Project Sector Studies: Haiti, Nepal, Yemen Arab Republic

Note: Numbers in parentheses represent percentages.

a/ Practical training includes physical education, arts and crafts, music appreciation and agricultural training.

223. Raise entry criteria. The principal mechanism for changing the nature of teacher training is revising the entry-level criteria for admission so that teacher training institutions are not obliged to provide a general secondary education to prospective teachers. Thus, wherever possible, entry to teacher training should be restricted to students with a complete secondary education, whether or not they have "passed" a secondary school leaving

examination. As an interim measure, some systems may need to admit into primary teacher training programs secondary school completers who have not passed the terminal examinations, provided that they are well-motivated to stay in teaching and are prepared to accept a lower starting salary.

224. Emphasize pedagogical skills. A second way of improving teachers' pedagogical skills is to restructure teacher-training to emphasize courses that develop the teacher's ability to reason about the content of instruction. As already discussed, teachers must not only have a sound content knowledge of the curriculum, they must be able to transfer it to their students. This involves critical analysis of the material they wish to present, a capacity to exploit analogies and examples to convey the information, and an ability to adapt the material to students' interests and abilities. Teachers must have the ability to organize and manage classrooms, and to evaluate, discipline and encourage students in a manner that promotes their learning.^{241/}

225. Institute practice teaching. Practice teaching, where a novice teacher leads a class under the direct supervision of an experienced educator, is a way of inculcating in a new instructor the instructional skills that are effective in enhancing student achievement. The effectiveness of practice teaching depends in large part on the capabilities of the mentor teacher and the management of the program. Three general patterns of incorporating practice teaching into teacher preservice training are: (i) observation and practice teaching integrated with course work over a period of months or years, (ii) practice teaching concentrated in a block of full-time teaching lasting from 2-5 weeks -- for example, in Ethiopia, practice teaching takes place in regular schools for a block of 2 to 3 weeks under the supervision of subject-matter specialist teachers; similarly, student teachers in Jordan, Morocco, Portugal and Malaysia spend a block of 5 weeks practice teaching -- and (iii) a full year of internship or supervised teaching. Year-long internships characterize practice teaching in such countries as El Salvador, Haiti, Jamaica, Tunisia, Gabon, and Lesotho. In some countries, practice teaching follows classroom instruction, while in others, it is sandwiched between years of formal courses.^{242/} Practice teaching helps prospective teachers to master pedagogical skills to a level that allows them to enter the classroom able to cope with unexpected events; however, care must be taken to ensure that practice teaching is taken seriously, prospective teachers are evaluated on their performance, and successful performance is a prerequisite for certification.

Motivation

226. Even competent teachers, with strong preparation, cannot be effective under adverse conditions. When teacher motivation is low, their ability to teach is impeded. Poor teacher motivation is primarily reflected

^{241/} Shulman (1987): 20.

^{242/} Haddad (1985).

in teacher's absence from classrooms, indifferent classroom practices and their early departure from the profession. Governments can improve teacher motivation by improving the professional and environmental conditions under which they work.

Teacher absenteeism

227. Many countries are not getting the best performance from their incumbent teachers, and are unlikely to get the best performance from new teachers. Lack of motivation and professional commitment has led to poor attendance, and non-professional attitudes toward students. Teacher absenteeism and tardiness are prevalent in many developing countries. For example, in Nigeria, government officers complained that, during school supervision visits, teachers were absent or late for no apparent reason.^{243/} Other surveys report high absenteeism among teachers in Sri Lanka, New Guinea and Mexico; absenteeism is especially acute in rural areas.^{244/} Apart from the obvious inability of students to learn from an absent teacher, absenteeism among teachers encourages similar behavior from students. In some countries, such as Mali and Somalia, enrollment is declining as parents and children react negatively to high rates of teacher absenteeism.

228. In large part, teacher absenteeism results from inappropriate incentive structures for teacher attendance. Absenteeism is high in developing countries for three primary reasons: (i) absolute salaries in some countries are so low that teachers must hold other employment to supplement their incomes; (ii) working conditions are poor; and (iii) local supervision, authority and administrative procedures are deficient.

Teacher attrition

229. In many countries, teachers are leaving the occupation. Faced with declining relative salaries and poor working conditions, many of the best teachers are leaving the profession to enter the private sector, or to teach at higher levels of education. In Haiti, the annual attrition rate of primary teachers is 10 percent. This high turnover is a result of teaching being viewed as a "transit" occupation. Many primary school teachers aspire to become tailors, or even chauffeurs, because the pay is better.^{245/} In Liberia, former teachers have taken positions as executive management officers, and medical and legal workers.^{246/} The increasing attrition rate, now over 5

^{243/} Harber (1984).

^{244/} V. Baker (1988). Schooling and disadvantage in Sri Lanka and other rural situations. Comparative Education 24 (3):377-388

^{245/} IEES (1987). Haiti.

^{246/} Ministry of Education, Liberia (1989).

percent, is now a cause for concern in Korean society.^{247/} The attrition of rate of teachers to other professions, estimated at 2 percent, has also been of some concern in the United States.^{248/}

230. If countries are to meet the increasing demands for teachers, they must reduce attrition. This has a number of benefits. First, countries need to ensure an economic and social return on the investment in training those teachers. The longer the teachers remain in the profession, the greater the return to the initial investment in training. Second, there are important savings in terms of the training required by additional teachers needed to replace those who leave. If the attrition rate increases at the same time as the demand for teachers increases then, in order to meet that demand, more teacher training colleges must be built. The recurrent costs of teacher training also increase, in terms of salaries, administrative placement costs and stipends. Table 4.1 estimated that a nominal 3 percent attrition rate can triple the number of teachers that need to be trained just to maintain the current teaching force numbers. Third, if the teachers have also benefitted from experience and inservice training, their productive capacity will be higher compared to new teachers. The evidence on the effect of experience on student achievement is, however, mixed. In fewer than half the studies reviewed were the effects positive.^{249/} Finally, communities with high turnover of teachers are likely to respond negatively by failing to provide new teachers with support and by removing children from school.

Factors affecting attendance and attrition

231. The factors that encourage attrition are similar to those that discourage attendance. Primary teachers' salaries are less attractive than many private sector salaries or salaries in other education sectors, working conditions are poor, and there are few opportunities for advancement within the profession. These factors combine to discourage new teachers from remaining in the profession and drive out experienced teachers. For example, studies in Africa found that teachers identified the following incentives as salient for decisions to enter or remain in teaching: salaries, non-salary benefits, working conditions and professional status.^{250/} Many of these incentives are either lacking or inadequate, as indicated in Table 4.9

^{247/} APEID (1984). Korea.

^{248/} S. Mertens and S. Yarger (1987). Teaching as a profession: Leadership, empowerment and involvement. Journal of Teacher Education 39 (1): 32-37.

^{249/} B. Fuller (1987); T. Mwamwenda and B. Mwamwenda (1989). Teacher characteristics and pupil's academic achievement in Botswana primary education. International Journal of Educational Development 9 (1): 31-42.

^{250/} Kemmerer and Thiagarajan (1989); Ministry of Education, Liberia (1989); B. Chivore (1988). Factors determining the attractiveness of the teaching profession in Zimbabwe. International Review of Education. 34 (1):59-77.

Table 4.9: Incentives determining attractiveness of teaching most frequently mentioned by teachers

Liberia

1. Payment of salaries on time.
2. Government provision of housing.
3. Adequate instructional materials in classroom.
4. Sufficient opportunity for inservice training.

Zimbabwe

1. Salaries competitive with civil service and private sector.
2. Opportunities for upgrade training and further education.
3. Adequate housing.
4. Opportunity for promotion.

Source: Kemmerer and Thiagarajan (1989); Chivore (1988)

232. Low absolute salaries. Teacher salaries and emoluments, which account for as much as 95 percent of government primary school recurrent expenditure in developing countries, are important motivators for teachers (Table 4.10). If salaries are so low that they are unable to provide a teacher's basic necessities, then absenteeism is likely to increase, as teachers engage in other pursuits to supplement their income. For example, a Liberia survey found that about 30 percent of all full-time teachers also worked their land or held other wage-earning jobs. ^{251/} In Indonesia, teachers report working 5-10 hours a week at other jobs. ^{252/} In Somalia, 36 percent of primary teachers report holding second jobs. ^{252/} Similarly, in Haiti, teachers devote their time to supplementing their incomes. ^{253/}

^{251/} Data courtesy of the Indonesian Ministry of Education, Balitbang Dikbud.

^{252/} IEES Project Sector Study (1984). Somalia.

^{253/} Kemmerer and Thiagarajan (1989).

Table 4.10: Median percentage of government recurrent expenditures in primary education devoted to teacher salaries, by GNP per capita

GNP per capita	Percentage to teacher salaries
Low	95.3
Low middle	91.0
Upper middle	87.9
High	76.1

Source: Annex Table 19.

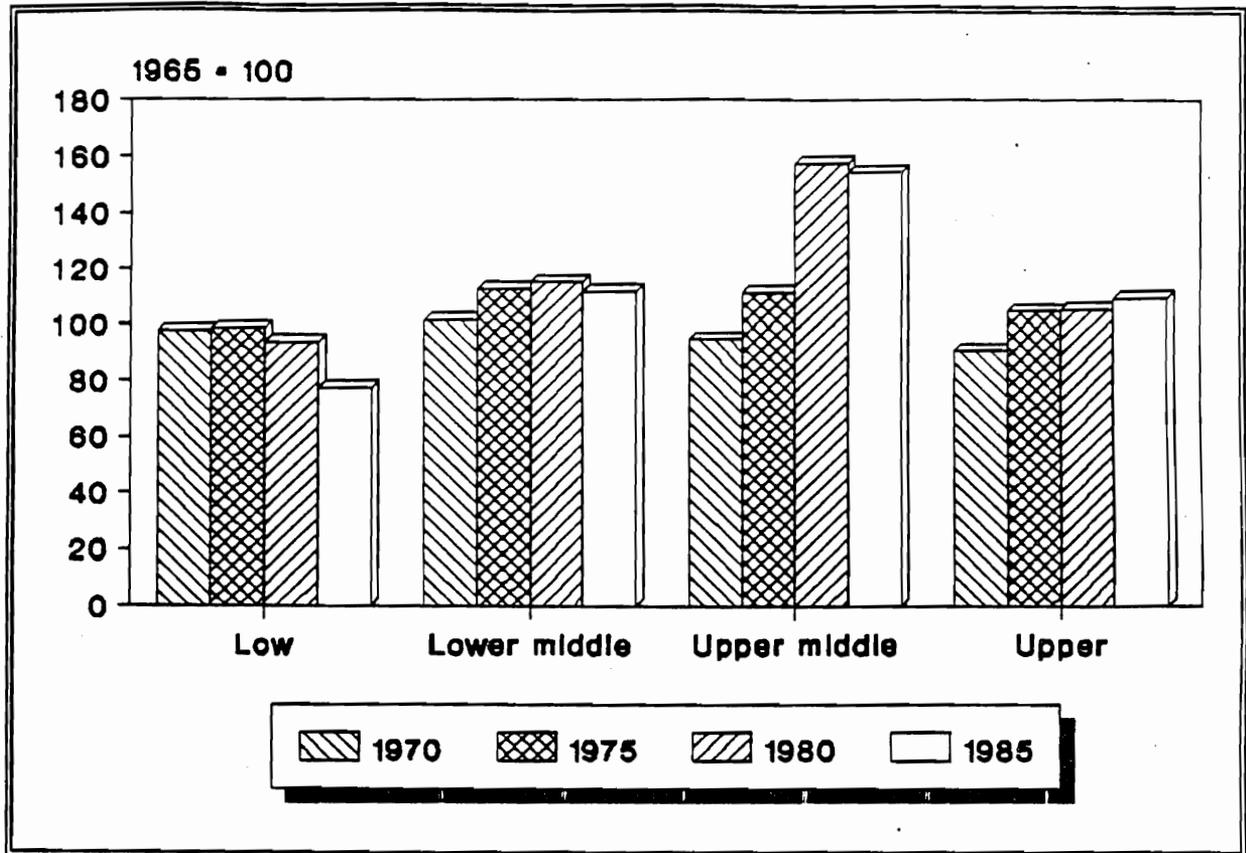
233. The expansion of the teaching force in many developing countries has eroded teacher salaries over the past two decades. Figure 4.1 displays total recurrent spending per teacher, expressed as an index.^{254/} In low-income countries (for which data are available) real expenditures per teacher fell between 1965 and 1985. Middle-income and high-income countries proved slightly better in raising real spending per teacher. The aggregation of all low-income countries masks substantial declines in some regions and countries. For instance, per teacher spending has fallen 30 percent on average among west African countries and 20 percent among east African countries since 1970. A similar level of decline also occurred among Central American countries for which data are available.^{255/} Schultz notes that rapid population growth has led to a decline in unit costs of education, and in particular in teacher wages.^{256/}

^{254/} This rough indicator represents total recurrent spending on primary schooling divided by the number of teachers. Governments, of course, spend different shares of their recurrent budget on administration, instructional materials, and maintenance. Also some teacher benefits, such as housing subsidies, may not come from the education ministry budget. Yet the bulk of recurrent spending at the primary level does go for teacher salaries. Thus the measure provides a reasonable indication of change in teacher compensation as the teaching force expands and government resources change over time.

^{255/} Computations based on figures from UNESCO Statistical Yearbook 1987 Unesco, Paris.

^{256/} T. Schultz (1985). School Expenditure and Enrollments, 1960-1980: The Effect of Income, Prices and Population Growth. Yale University Economic Growth Center Discussion Paper No. 487: New Haven, CT.

Figure 4.1: Index of recurrent spending per teacher in constant 1985 US dollars, by GNP per capita



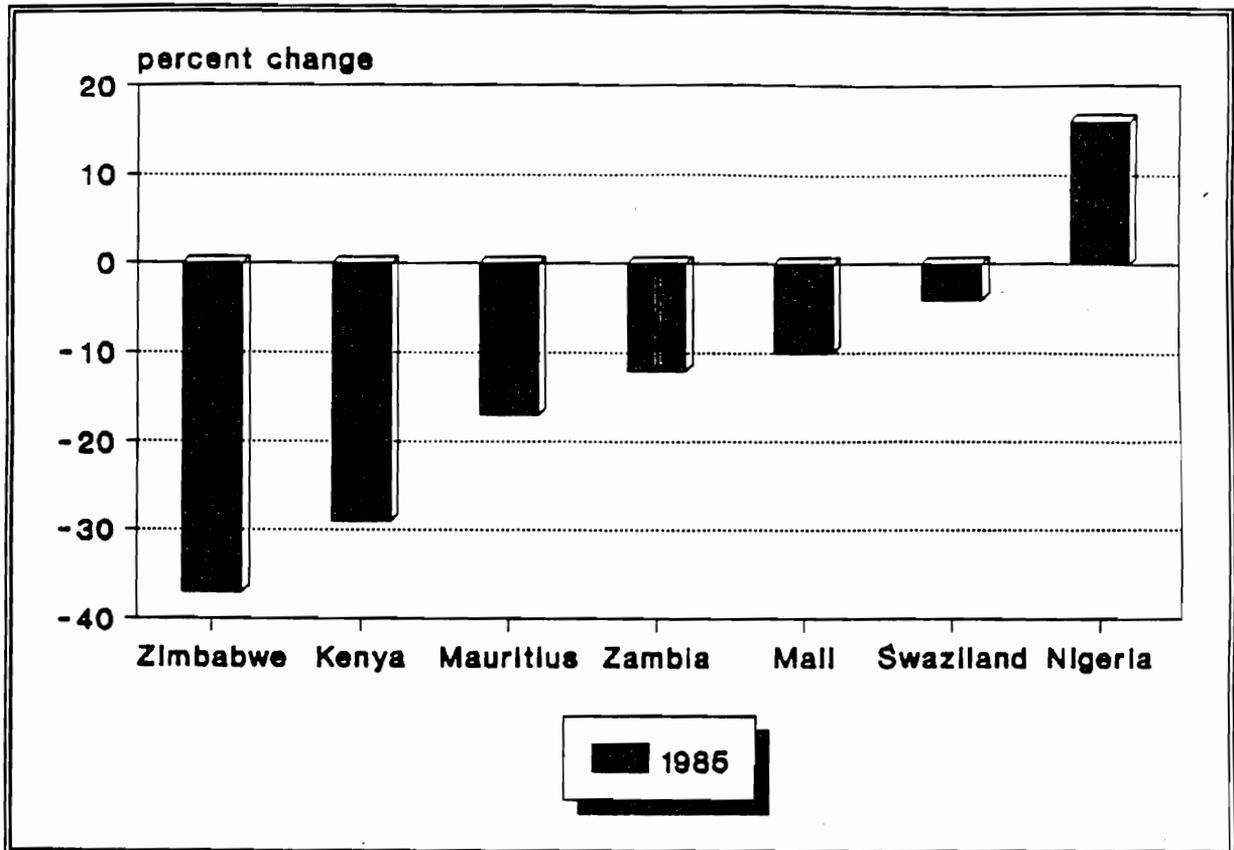
Source: Annex Tables 7 and 19.

234. A recent World Bank study found that real teacher earnings declined 20 percent in Francophone Africa and 13 percent in east and southern Africa. Figure 4.2 shows that change in real earnings varied among different African countries. Teachers in countries with lower GNP per capita experienced greater erosion of their real salary levels. In only one country in the sample, Niger, did real teacher salaries increase between 1980-1985; the remaining 17 countries in the survey reported declines.^{257/} In Somalia, the average teacher salary equals about one-half the average cost of living, even following a recent doubling of wages (in current terms); teachers now earn the equivalent of US\$6 per month (or 25 percent of GNP per capita).^{258/}

^{257/} Zymelman and DeStefano (1989).

^{258/} Kemmerer and Thiagarajan (1989).

Figure 4.2: Percent change of real earnings in seven sub-saharan African countries, 1980-1985

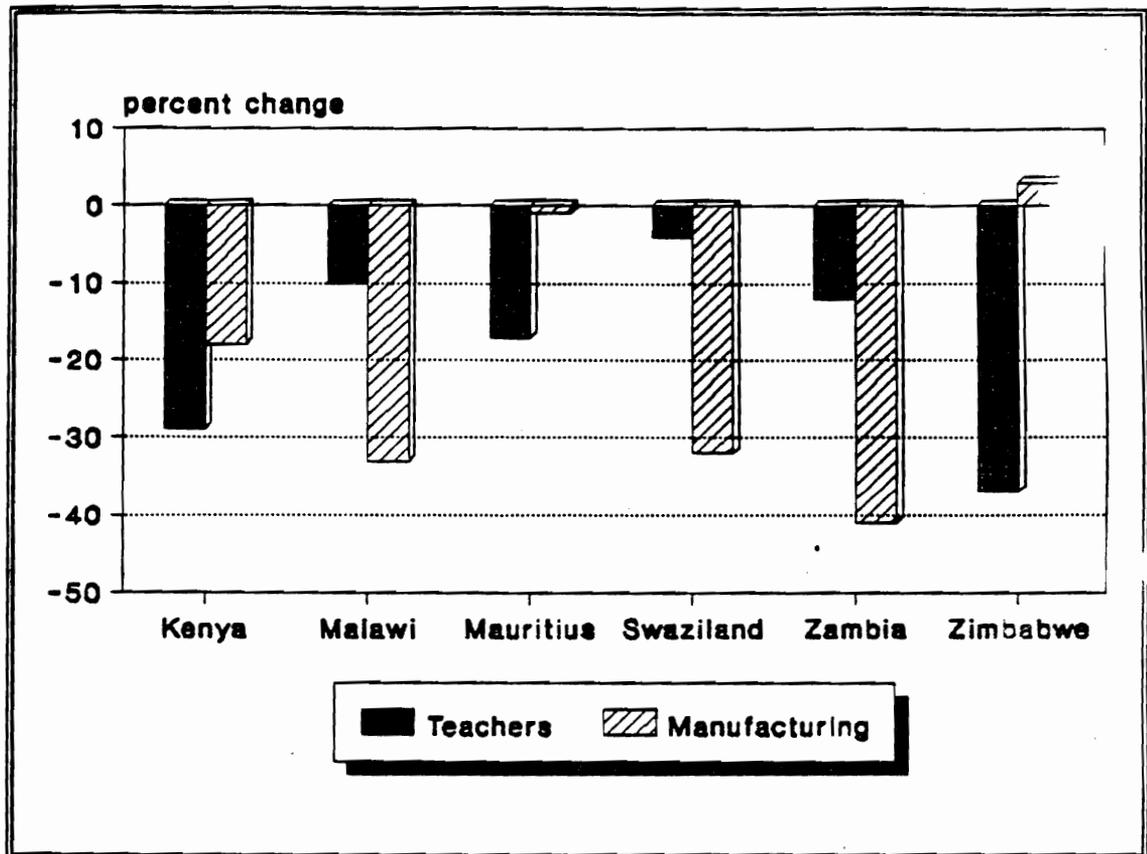


Source: Zymelman and DeStefano (1989).

235. Low relative salaries. If teacher salaries are declining relative to other sectors, then more qualified prospective and incumbent teachers are likely to move out of teaching. Relative salaries also affect the perceived status of teaching, influencing candidate choices during the recruitment process. Figure 4.3 shows change in real teacher salaries against changes in real average earnings in the manufacturing sector for sub-Saharan African countries between 1980 and 1985. The figure only shows relative movements, and not initial starting points. A mixed picture is presented. In Zambia, for instance, the average teacher salary equalled the average manufacturing wage in 1980. By 1985, teachers made 50 percent more, on average, than did manufacturing workers, despite a 15 percent decline in real earnings. Yet, in other countries, teacher salaries declined relative to the manufacturing sector. Teachers in Kenya, in 1985, earned just 85 percent of the average

manufacturing worker's wage. In Zimbabwe, teachers earned 70 percent more than manufacturing workers in 1980, but only 5 percent more in 1985.

Figure 4.3: Percent change in real teacher earnings and average manufacturer earnings from 1980 to 1985



Source: Zymelman and DeStefano (1989).

236. Teacher salary data are less complete for other regions. One study of teacher salaries in three Latin American countries (Argentina, El Salvador, and Panama) showed that teachers' salaries are equal to or somewhat below average civil service salaries, but are higher than average manufacturing wages.^{259/} However, a study from Brazil painted a more pessimistic picture. In 1980, male primary school teachers earned 8 percent less than clerks and female teachers earned 12 percent less, even though they had received, on

^{259/} A. Cox Edwards (1989). Understanding differences in wages relative to income per capita: the case of teachers' salaries. *Economics of Education Review*. 8 (2): 197-203.

average two more years of schooling than had clerks.^{260/} As early as 1970, average teacher earnings equalled just 95 percent of average household (cash) income. In urban centers, teachers earned much less than the average household income level.^{261/} In Haiti, teacher salaries in non-government (usually church-related) schools, which serve about 70 percent of all primary school pupils, range from US\$25 to US\$80 per month (GNP per capita is \$30 a month).^{262/} In Asia, teacher salaries were quite competitive in the Republic of Korea and Singapore in the early 1980s.^{263/} Historically, salaries have been low in Indonesia.^{264/} In Pakistan, only top-ranked primary school teachers earn a wage equal to the average salary in manufacturing.^{265/} In those countries where the wage sector is strong, teacher salaries are falling behind, relatively. However, in those countries where the wage sector is small and continues to expand, teachers salaries remain relatively strong. In some cases, teachers may have high relative salaries but may not be paid on time.

237. Comparisons of intra-sectoral disparities reveal that, even within the education sector, primary school teachers receive low salaries. Salary schedules provide significant differentials based on the teacher's own level of preparation and the educational level at which they teach. In Botswana, for example, the salary of a university graduate teaching in an upper-secondary school is 15 times more than that of a lower-secondary graduate teaching in a primary school.^{266/} This differential represents a priority that may have been sensible in the past but is dysfunctional within countries that need to place a priority on primary education and basic literacy.

238. Salaries have generally declined in both real and relative terms in low-income countries. In those few countries that have a weakening private sector the situation of teachers appears to have improved relative to other occupations, although in many cases their salaries have still declined in real terms. In middle-income countries the teaching profession has fared slightly better absolutely, although the morale of teachers is still lowered by the relative level of teachers salaries as compared to equally qualified peers in the private and public sector.

^{260/} Psacharopolous (1987).

^{261/} N. Birdsall and M. Louise Fox (1985). Why males earn more: Location and training of Brazilian schoolteachers. Journal of Economic Development and Cultural Change. 33 (3): 533-556.

^{262/} IEES Project (1987). Haiti.

^{263/} Cox Edwards (1989).

^{264/} Beeby (1979); IEES (1984). Indonesia.

^{265/} APEID (1984). Pakistan.

^{266/} Botswana, Ministry of Education and Culture (1986). Education and Human Resources Sector Review: Botswana. Gaborone, Botswana.

239. Non-salary benefits. An analysis of teacher compensation must also include non-salary benefits received by teachers. Incentives offer a selective way to augment individual incomes. A recent study of wage-earners in Côte d'Ivoire, for instance, found that housing, transport, and other benefits boosted teachers' total compensation by 10 percent above the average salary. In Senegal, non-salary benefits equaled 30 percent of the average salary. In Mali, these benefits raised total compensation by about 20 percent.^{267/} These benefits can help offset the low salaries received by primary school teachers. This, in turn, improves the relative salaries, although it may be that teachers do not receive other in-kind payments (such as bonuses and commissions) to the same extent as private-sector employees.

240. Hardship allowances and in-kind salary supplements are also important incentives for the deployment of teachers. The more rational and equitable deployment of well-prepared teachers to rural schools, in particular, requires special attention. Governments presently provide a panoply of special benefits for rural teachers: higher pay, more rapid promotion, enriched housing benefits, and subsidized access to public services. In Nepal, for example, the salary premium can exceed 100 percent of the base salary paid to urban teachers.^{268/}

241. Providing incentives for rural teachers will be necessary to ease the shortage of high-quality rural teachers. Although extrinsic incentives will be needed, appealing to intrinsic rewards will also be important. For example, Mexico has experimented with guaranteeing advanced training, based on length of service in rural areas.^{269/} The provision and encouragement of in-service training in rural areas to improve the professional skills of teachers, combined with efforts to encourage greater intra-school communication, can mitigate the perceived negative conditions of rural positions. In addition, teacher candidates from rural areas might be recruited and deployed in their home areas. Here returning authority to local communities in the recruitment and deployment of teachers may reinforce community connections and boost teacher retention. In general, steps should be taken to reduce the professional isolation often experienced by teachers posted in rural areas. Non-salary benefits provide a good opportunity to redress deployment difficulties. In Pakistan, for example, housing clusters for women teachers have been established to reduce rural isolation, encourage professional interaction, and increase safety.

242. Some south Asian countries have been providing teachers in urban areas with salary differentials to compensate for a higher cost of living associated with urban sectors. This may be inefficient. Subsidies to urban teachers are an example of policies that further distort already skewed

^{267/} Zymelman and DeStefano (1989).

^{268/} IEES Project (1988). Nepal.

^{269/} Dove (1986).

teacher distribution, providing incentives for teachers to remain in urban areas. Moreover, family networks and support systems tend to be stronger in urban areas, and the non-material rewards associated with urban dwelling -- better services and improved quality of life -- are compensation enough to attract potential teachers.

243. Comparatively short working weeks, coupled with extended vacations, are traditionally considered benefits of working in primary education, and are perceived as motivating factors in attracting candidates to the teaching profession. Teachers reportedly work 120 hours per month on average (versus wage earners who work 185 hours per month) and receive, on average, twelve weeks holiday a year.^{270/}

244. Poor working conditions. In general, conditions within the classroom discourage potential candidates and force incumbent teachers out of the profession. Schools suffering shortages of basic instructional materials make it difficult for teachers to do their job efficiently. School buildings are poorly maintained, facilities are inadequate. At one site in Nigeria three schools with more than 3000 pupils used only two pit latrines between them.^{271/} In the Philippines, there is a perennial shortage of classrooms. Often more than 55 students are crammed into classes built for half that number.^{272/} In Haiti, many classes have to be taught outdoors.^{273/} These conditions demoralize teachers, discourage their professional commitment, and as indicated in Chapter III, affects student performance.

245. Administrative inadequacies. Local authority and supervision is an important part of ensuring teacher productivity. Headmasters currently have little authority to sanction teachers who do not turn up for work. Centralized bureaucracies undermine the headmaster's capacity to manage his or her staff, by imposing complicated procedures for redress. In Nigeria, the Headmaster's authority is undermined by their frequent transfer between schools, and by a failure of the Ministry of Education to pursue complaints.^{274/} The failure of central authorities to provide support services is equally damaging. For example, in Liberia, the payment of salaries on time was the most important factor determining the attractiveness of teaching for trainees and incumbent

^{270/} UNESCO (1988). UNESCO (1982). Joint ILO/UNESCO Report of the Committee of Experts on the Application of the Recommendation Concerning the Status of Teachers. Geneva: UNESCO.

^{271/} World Bank (1988). Federal Republic of Nigeria Primary Education Subsector study.

^{272/} APEID (1984). Philippines.

^{273/} IEES Project (1987) Haiti.

^{274/} Harber (1984).

teachers and a major factor determining the departure of former teachers.^{275/} The survey found that salary payments were coming three to five months late.^{276/} Teachers surveyed in Yemen and Haiti also considered the late payment of salaries a disincentive.^{277/} The late payment of salaries often encourages teachers to absent themselves from school in order to travel to the central administration to collect their payments. These journeys can leave classes unattended for up to a week. Similarly, the lack of experienced and dedicated supervisors or inspectors discourages improved teaching practices and encourages absenteeism. A number of surveys in Indonesia, Papua New Guinea, and Mexico confirm the inadequacy of the support systems.^{278/} This is pursued further in Chapter V.

246. Career advancement and promotion. Organizations traditionally accept and promote employees in two ways. First, junior staff members work on a probationary status while their performance and fit with the organization are assessed. A good deal of socialization transpires as new staff members learn the performance standards of the firm or institution. These early years, for young professionals, also allow the individual time to learn the craft, ideally working closely with skilled mentors. Second, staff members are awarded more secure status, with advancement and salary increments linked to actual performance.

247. Neither of these incentive devices -- careful induction and performance-based promotion -- is as commonly applied in teacher personnel systems as they should be. The hiring of 'temporary' or part-time teachers is commonly done in developing countries. But this status is usually assigned to unqualified teachers, and opportunities for further training and advancement are limited. Regular new teachers, in effect, enter the teaching service when they begin a teacher training program. Teachers receive an annual salary increment and rank increase automatically, despite the fact that teachers' length of tenure is not consistently related to their pupils' achievement.^{279/}

Policy options

248. The pressure to expand educational capacity has stretched resources between the need to employ new teachers and the need to adequately compensate incumbent teachers. Expanding the teaching force may mean fewer resources available to provide training and economic incentives to improve the existing teaching force. Motivating and improving the existing cadre may occur at the expense of denying more students access to basic education. Individual

^{275/} Ministry of Education, Liberia (1989).

^{276/} Ministry of Education, Liberia (1989).

^{277/} Kemmerer and Thiagarajan (1989).

^{278/} Baker (1988).

^{279/} Fuller (1987).

country differences will greatly affect allocational priorities. For example, Korea and Indonesia, middle-income countries which have experienced a reduction in enrollment growth, have sufficient teachers to cover future enrollments.^{280/} In those countries, educational resources can be directed toward training and motivating incumbent teachers, and improving managerial and administrative support for the active teaching force. However, in many low-income countries, particularly those in Africa, teacher shortages still persist, largely due to continuing population growth. These countries must direct their resources primarily toward filling these shortages. Nevertheless, there are still policy options that countries should consider when addressing the issue of teacher motivation and productivity.

249. Provide sufficient salaries. The absolute decline in real wages undoubtedly affects teacher motivation, attendance and performance in the classroom. The provision of salaries to a level which covers basic needs is essential to ensure consistent teacher attendance. In those countries where teacher base salaries are equal to, or greater than, comparative sector salaries, governments should use marginal increments in resources toward targeted incentives that promote teacher performance. Direct fiscal incentives, non-salary benefits, and promotional opportunities can be used to promote teacher productivity.

250. Redefine salary schedules. Salary schedules provide the underlying structure of opportunities and incentives for advancement. Current salary schedules, based on certification and experience, tend to over-reward degrees and under-reward experience. This reduces the willingness of teachers to remain in education. In sub-Saharan Africa, for example, pay scales tend to be "front-loaded," with salaries based on certification, rather than experience; the differential in pay between the highest and lowest entry category in ranges from 2.78 in Togo to as low as 1.08 in Zaire, with the average being around 1.75.^{281/} Similarly, in Nepal, the highest ranked primary school teacher (with two years of university training) earns about 60 percent more than the lowest ranked post (with lower-secondary schooling or less). Opportunities for advancement within the primary subsector remain quite limited. Salary scales are designed so that a teacher will reach the plateau of maximum salaries around the 10th year, and sooner for more qualified applicants.^{282/}

^{280/} Improving the Efficiency of Educational Systems (IEES) Project (1986). Indonesia Education and Human Resources Sector Assessment. Tallahassee, Florida: Florida State University; Asian Programme of Educational Innovation for Development (APEID) (1984). Towards Universalization of Primary Education in Asia and the Pacific: Republic of Korea. Unesco Regional Office for Education in Asia and the Pacific, Bangkok: Unesco

^{281/} Zymelman and DeStefano (1989).

^{282/} Zymelman and DeStefano (1989).

251. Salary schedules may need to be delinked from the uniform scale of the civil service. Linking salaries to the civil service may sustain the professional identity of teachers in some countries, but uniform salary schedules and automatic pay increases are dysfunctional. They neither reward superior teacher performance nor penalize poor performances. However, changes in the structure of compensation will result in trade-offs between the recruitment of high-quality new teachers and the retention of existing teachers. Increasing starting pay while reducing the rate of increase over time would encourage a supply of more qualified new teachers, but would also encourage experienced teachers to leave for other occupations. To reduce starting salaries and increase the rate of increase of salary increment would discourage new prospective teachers. Changes in compensation packets should not, however, be used in isolation. Instead they should be linked to the array of incentives available to ministries.

252. Reward teacher performance. Under a system of merit pay -- a commonly suggested method to encourage performance -- a significant portion of a teacher's salary is based on her/his performance, as assessed by supervisors, in an effort to encourage harder work. However, there are problems associated with this form of remuneration. Unlike factory production, teacher supervisors cannot monitor a consistent set of activities. Establishing an evaluation system that provides justification for supervisors' decisions is costly in terms of both time and money. The system tends to promote divisiveness within schools, as teachers attempt to bias the impartiality of supervisors by detracting from the performance of colleagues. Furthermore, evidence suggests that teachers respond negatively when they are not awarded merit pay. Instead of eliciting higher effort, teachers respond with bitterness and a lack of cooperation.^{283/} Finally, in small rural schools with only one or two teachers, evaluation is made still harder, because of the need for external supervisors, already in short supply. Yet, in one-teacher schools, merit pay may have the greatest impact, as suggested by experience in the Seti Zone Project in Nepal in which teacher payments were provided by supervisors who observed evidence of performance.^{284/}

253. One alternative is the adoption of a program that provides grants for teachers to pursue innovative teaching projects in their classrooms. Grants can be targeted toward specific goals (literacy, for example), and teachers receive a proportion of the amount as reward on successful completion of the project. The teachers would be nationally recognized and, where possible, their innovations adopted. Unlike merit awards, teachers would be given clearly established objectives and energetic teachers provided with

^{283/} R. Murnane and D. Cohen (1986). Merit pay and the evaluation of the problem: Why some merit plans fail and few survive. Harvard Educational Review 56 (1): 1-17.

^{284/} N. Bennett (1989). How Can Schooling Help Improve the Lives of the Poorest? The Need for Radical Reform. Washington, D.C.: World Bank. (processed)

recognition which would raise the visibility of the teaching profession.^{285/} Another option is the adoption of school-level reward programs. Schools that show a significant improvement in the quality of their graduating students would be rewarded with an across-the-board salary increase for teachers. This, however, could have serious equity consequences.

254. There is some evidence to suggest that financial incentives can improve attendance. For example, one North American study found that teacher absences declined significantly and that perfect attendance increased dramatically, from 8 percent to 34 percent, during the first year of an attendance incentive plan, in which a teacher would draw one share from a parimutuel pool for each day absent less than the mean absence of the previous year.^{286/}

255. There is also ample evidence to suggest that appropriate supervision and delegation of authority to school-level is influential in improving attendance. As discussed in Chapter V, the empowerment of headmasters is important for maintaining school discipline. Teachers must be made more accountable.

256. Improve administration and communication links. Available evidence points to an inadequate administrative support system. Teachers are poorly deployed, either to regions where they do not want to teach, or into subjects which are not their comparative advantage. In Botswana, for instance, the government had been recruiting costly expatriate math teachers -- the establishment of a new MIS system revealed that the country possessed an ample number of math specialists but they had been assigned to teach other subjects. Cancellation of the expatriate program yielded substantial salary savings. Regional deployment, however, poses many problems. Because the opportunity costs (in terms of health, isolation etc.) are high, incentives to work in rural areas must be also be high to attract teachers, and even then are only "pill sweeteners."^{287/} As long as working conditions in rural areas remain poor compared to cities, and adequate incentives are not offered in compensation, teachers will become dissatisfied if they are not quickly redeployed. Administrations must improve working conditions in those areas, as well as to provide adequate incentives to attract teachers. Central bureaucracies must also accelerate responses to demands from local authorities. The payment of teacher's salaries on time, the rapid provision of replacement staff, and consistent supervision will all increase the time on job of teachers.

^{285/} Murnane and Cohen (1986).

^{286/} S. Jacobson (1988). The effect of pay incentives on teacher absenteeism. The Journal of Human Resources, 24 (2): 280-287.

^{287/} L. Dove (1982). The deployment and training of teachers for remote rural areas. International Review of Education 28 (1): 3-27.

257. Encourage teacher professionalism. Organizational devices are urgently needed that encourage teachers to become more professional -- actively reflecting on their own knowledge and pedagogical practices, then pursuing remedies for particular weaknesses. Inservice training programs increasingly encourage teachers to engage pupils in more active ways. In a series of studies conducted by Bristol University, teachers said that they would like more opportunities to improve their abilities through inservice training (97 percent of those questioned in Botswana, 92 percent of those in Ghana), although most (52 percent on average) also cited that they would more readily attend if they felt that their qualification or salaries would improve as a result.^{288/} But until the teacher's role is seen to require professional growth and responsibility, the effects of inservice workshops on long-term change in teacher behavior will be short lived.

258. One modest first step would involve a more direct linking of inservice teacher training to salary increments and promotion prospects. This would require some standardization of inservice workshops, in terms of specific competencies provided and length of instruction. The Gambia has moved successfully in this regard, equating a series of inservice courses to more conventional (and costly) preservice programs. The less costly inservice sequence is tightly linked to promotions.^{289/} In Ghana, the costs associated with selection of candidates for training and promotion have been reduced by advertising the posts. This has the advantage of ensuring the willingness of the staff for the post, and reduces the administrative costs.^{290/} However, governments should carefully assess what knowledge and skills are effectively delivered within teacher training programs. Linking new teachers' status and promotional opportunities to training is sensible only if that training reflects the increased investment.

259. The adoption of career ladder plans has been proposed as one way to retain able and talented teaching staff. While adaptations must be made to the particular circumstance, most career ladder plans have certain common features: predetermined criteria for advancement; objective evaluation procedures; opportunities for teachers to accept new roles; and stipulations of training/certification for advancement. Difficulties may arise in the relationship between teachers and administrators, in the cost-effective evaluation of a teacher's performance, and in the ability to provide

^{288/} INSET Inservice Training of Primary School Teachers project (1982). Bristol, England; Bristol University School of Education.

^{289/} Commonwealth Secretariat (1984). Country Papers - Volume 4(g): Gambia. Author.

^{290/} A. Thompson (in press). Making the best use of staff we already have: deployment issues, in Rust and Dalin (in press).

sufficient opportunities for advancement.^{291/} Nevertheless, grades or ranks -- such as senior teacher, head of departments, vice- or assistant- or deputy-principal -- help to create avenues for recognition and promotion of good performers. This is detailed further in Box 4.2

260. The delinking of teachers from civil service salary schedules will make the task of implementing career ladders easier. The civil service exerts a rigidity over the salary structure which inhibits the success of the career ladder concept. In some countries, Malawi for example, a separate teaching service has been established.

261. The formation of teachers unions or professional associations with the right to settle salary and working conditions through bargaining and negotiation would provide the facility for teachers to be able to improve their conditions, and provide a basis to rejuvenate professionalism among teachers. This would also include the opportunity for teachers to participate in decision-making, and the development of curricula. The self-determination of roles, function and conditions of service is an important aspect of any professional body. In those countries where teaching bodies have been allowed to play an active role in their position, teacher's associations have introduced innovations, such as Zambia Science Teachers Education Project (ZAMSTEP) where the crucial subject areas of science and mathematics have been improved, or Ghana's EDSAC 1, which encourages community involvement in junior secondary education provision.

262. As the teaching profession improves in status, the quality of prospective teachers applying rises. Until then, earlier exposure to the teaching profession could motivate young pupils to pursue this career. Pakistan, for instance, is experimenting with an 'assistant teacher' job category that helps bring (less qualified) youth into classrooms.^{292/} Inclusion of secondary school pupils in such schemes could help stimulate greater interest in teaching.

^{291/} P. Burden (1984). Are Teacher Career Plans Feasible in Rural and Small Schools? Paper presented at the annual Rural and Small Schools Conference. Manhattan, KS.

^{292/} D. Warwick, F. Reimers and N. McGinn (1989). The Implementation of Reforms in the Primary Schools of Pakistan (mimeo). Cambridge, MA: Harvard Institute for International Development.

Box 4.2: Career ladders and teacher performance

Career ladders can have a positive impact on teacher quality. Evidence from a career ladder that has been in operation in Great Britain for 40 years reveals that it has contributed significantly to the improvement of education in that country. Teachers progress up a five-rung ladder through competitive promotion. British schools have a limited number of positions which are nationally advertised as they become available. The higher the rung of the ladder, the more responsibility a teacher receives.

The ladder has a number of advantages. It provides good role models, placing enthusiastic teachers in positions where they can influence younger teachers; there is significant leadership development as principals and assistant principals are prepared for their roles through advancement up the ladder; because more teachers are given authority, responsibility is more widely shared and teachers are more involved at school-level; finally, the ladder offers teachers the opportunities to develop new skills and accept new challenges. Career ladders can be designed to suit particular needs. Thus, levels can be introduced to promote teachers who are content to remain in the classroom, or rural schools could be given greater emphasis in the placement of promoted teachers.

North American examples of career ladders include a Tennessee State plan, which has a Senior Teacher rank (rung three of four), the holder of which is encouraged to teach remedial students in the summer; develop curricula; and counsel Apprentice Teachers (the lowest level of the ladder). In Wisconsin, a similar position is held by a Teacher Specialist, whose tasks include staff development and apprentice guidance. Indonesia is currently evaluating a career ladder introduced to encourage teachers to work in rural areas.

One of the fundamental difficulties with career ladders is their funding. Although the reward of attaining new skills and accepting new challenges is important for teacher motivation, many of these benefits would be jeopardized without the incentive of higher pay. Introducing the ladders can also be fraught with difficulties. Transition plans need to be developed, teachers need to be informed of the available opportunities, and a system of performance accountability needs to be developed. Nevertheless, the potential benefits to be derived justify experimentation.

Sources: P. Burden (1984). Are Teacher Career Ladder Plans Feasible in Rural and Small Schools? Paper presented at the annual Rural and Small School Conference, Manhattan, KS; M. Murphy and others (1984). Teacher Career Ladders in Britain. A Study of their Structure and Impact. University Council for Educational Administration: Columbus, OH.

263. Improve working conditions. It is clear that the conditions under which many of the world's primary teachers must work are untenable. Research has linked student performance to the provision of adequate facilities. In Botswana, a survey of 51 primary schools revealed that in those schools that provided sufficient classrooms, desks and books the students performed significantly better in academic tests.^{293/} In Malta, teachers proved to be motivated by the conditions in which they worked, and by intrinsic pedagogically-related factors. Thus, teachers were more motivated the better their students performed.^{294/} If pupils must share a textbook or do not have paper on which to write, they will not perform well and more complex forms of instruction (such as working in student groups) becomes more difficult. Technologies that help structure the delivery of lessons, while encouraging teacher and pupil initiative, are especially important. Textbooks and instruction manuals, for instance, help structure the curriculum and ensure that more material is covered during the school year.^{295/} Improving working conditions has two effects. It enables teachers to function better, and it enables students to perform better. The latter reinforces the teacher's motivation, and consequently classroom practice.

Summary

264. A key determinant of student achievement is the quality of teaching. An effective teacher should possess, at a minimum, a thorough knowledge of the subject matter of instruction, an appropriate repertoire of pedagogical skills, and motivation. The teaching force in many developing countries fails to meet these standards. Governments will have to design policies and programs aimed specifically at improving the academic and pedagogical preparation of teachers and providing incentives to increase their motivation and professional commitment. The challenge is particularly difficult in low-income countries: they not only have to improve the quality of the teaching force but must simultaneously expand their teaching force if they are to achieve universal primary education.

265. Addressing the problem of inadequate academic background will require shifting the general education component of teacher training to general secondary schools, shortening preservice teacher training, and improving the recruitment process for teacher training institutes. Strategies for developing good pedagogical skills will include revising the admission requirements, emphasizing pedagogical methods, and incorporating practice teaching into preservice training. Improving teacher motivation is perhaps

^{293/} T. Mwamwenda and B. Mwamwenda (1987). School facilities and student academic achievement. Comparative Education 23 (2): 225-236.

^{294/} C. Farrugia (1986). Career choice and sources of occupational satisfaction and frustration among teachers in Malta. Comparative Education 22 (3): 221-232.

^{295/} Lockheed, Vail and Fuller (1986).

the trickiest task that governments face in their efforts to upgrade the teaching force. Doing so will require a variety of measures, including the provision of adequate salaries and non-salary benefits, improved working conditions, opportunities for professional advancement, incentives for good performance, and strengthened supervision and support. If governments are serious about achieving an effective primary education system, they will have to take the necessary steps to develop a well-trained and highly motivated teaching force.

UNIT C

Module 13

Objective(s):

1. **To emphasize the link between school-level and system-level management practices.**
2. **To summarize the impact of centralization and decentralization on principal education goals.**
3. **To review Thailand's experience with school clusters.**
4. **To illustrate how the recent management reform in Sri Lanka facilitated improvement of specific groups of schools.**

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The Role of Management in the Educational Process

Basic education seeks to provide modern knowledge, skills, and attitudes to children who often come from traditional homes. The schools require special resources to achieve their purpose. At a minimum, the schools require a teacher who understands, and is willing to convey, the modern curriculum. In communities with large numbers of children, more than one teacher is required. Therefore, a school may be created with one of the teachers being placed in charge. Local communities can hire teachers, but they are not capable of providing teachers with the background necessary for conveying the modern curriculum. Thus, even the most independent local community depends on others for some of its educational resources.

The process of bringing critical resources to schools and mobilizing them in an effective way is what will be referred to as **educational management**. Two dimensions are useful in the analysis of educational management:

1. The range of resources and services. The BRIDGES list of policy areas provides a good summary of the full range of resources that schools require to achieve their objectives. The most critical resources are teachers and instructional materials. Supporting these are other policy inputs such as curriculum development, instructional methodology, facilities, student selection, management and supervision. Finally, schools require the financial means to pay for resources and services.
2. The level at which critical decisions are going to be made to provide each of these resources/services to the schools.

Earlier in the field of development of education, there was a bias towards centralization. In recent years, the centralized approach has been questioned. Some broad generalizations are possible:

Access/Equity. Centralizers maintain that the only way to provide a uniform spread of resources and services is through systematic distribution from the center. Decentralizers are concerned with the equitable distribution of resources that correspond with an individual's position and ability.

Academic Quality. Perhaps the original impetus for centralization was to raise the quality of education by establishing high standards. Such standards would indicate what the curriculum should cover and how much students should achieve. Measures of these standards are indicated in promotion rates and by entrance examinations. Through systematic research from the center, it is possible to develop a curriculum based on the most advanced understanding of human learning potential. Decentralizers maintain that higher quality can be realized if those directly responsible for the classroom process, and most in touch with student progress, have control over the setting of curricular goals, the acquisition of resources, and the determination of progress.

Values. A major concern of all educators is to convey to students a sense of what should be valued in a society. Centralizers stress the importance of conveying a common social code so that society will have order. Decentralizers stress the importance of individual or local values treasured by the community or religious groups.

Internal Efficiency. Centralizers argue that multiple centers for the production and distribution of resources and services lead to much duplication of effort and waste. Decentralizers point out the economies of scale associated with smaller units of production. They also observe that smaller units enhance the relevance of education and improve the speed of distribution. Both sides maintain that their approach minimizes graft.

External Efficiency. Centralizers who focus on the relations between societies argue that schools need to convey the knowledge and skills that will serve the national interest in international competition. Decentralizers observe that citizens live their lives in local and regional cultures and economies and need to learn the knowledge and skills appropriate to those settings. Uniform national curricula fail to prepare individuals for local circumstances, and moreover, cause difficulties for students as the language and symbols used in the curricula include "foreign" material.

Implications of Management Practices Differ by Resource/Service

These educational system generalizations are not sensitive to the different resources and services affected through management. Each of these resources and services could be a topic for separate treatment in a discussion of educational management.

Research on the actual administrative and management practices of developing societies indicates considerable variation in the extent to which the respective resources and services are "centralized" or "decentralized." Take a look at the following diagram (see Diagram 1 on page 4). It lists several resources and services and asks who controls, administers, and finances each of these. Educators from over forty locations have been asked to respond to these questions and no two answers were the same.

Overhead 1

In fact, to date, there has been very little research on the level of decision-making that results in the best educational outcomes. Winkler has provided one survey.¹ Within the BRIDGES SHARE software, a number of studies are summarized under such headings as production of textbooks, provision of facilities and teacher training.

¹ Winkler, D., Decentralization in Education: An Economic Perspective (1987).

Diagram 1

RESOURCES/ SERVICES	WHO CONTROLS	WHO ADMINISTERS	WHO FINANCES/ DIRECTS
------------------------	-----------------	--------------------	-----------------------------

STUDENT SELECTION

TEACHER SELECTION

TEACHER COMPENSATION
& PROMOTION

TEACHER TRAINING

STRUCTURE OF SCHOOLS
(e.g. SUBJECT OR
CLASSROOM SPECIALIST)

STRUCTURE OF CLASSROOMS

CURRICULUM

TEXTBOOKS

TEACHING MATERIALS

STUDENT ADVANCEMENT

SUPERVISION/INSPECTION
OF SCHOOLS

ACTORS: 1=CENTER, 2=PROVINCE, 3=DISTRICT/COMMUNITY, 4=SCHOOL (OR
SCHOOL COUNCIL), 5=FAMILY, 6=OTHER, 0=NOBODY

NOTE: WHERE TWO OR MORE ACTORS WITH EQUAL ROLE, WRITE 1=3; WHERE
TWO OR MORE WITH DIFFERENTIAL RESPONSIBILITY, WRITE IN
ORDER 5/3

BRIDGES has carried out several pieces of research on the effects of different arrangements for the management and supervision of schools and educational systems. Two of these studies, Thailand and Sri Lanka, will be reviewed.

Thailand

Thailand has a comparatively well-endowed educational system with adequate buildings and textbooks. Moreover, most of the teachers have received formal teacher training. However, from the late seventies, the Office of the National Primary Education Commission (ONPEC) mounted a series of programs to improve the quality of Thai education.

One of the central concerns behind the reforms was summarized by ONPEC's Deputy Secretary-General, Dr. Rung Kaewdung:

The problem was like this: the control of primary school education in Thailand at the time was very, very poor. For example, there were no training requirements for principals. There was little leadership by the principal because when we changed the curriculum, we didn't train the principal. We only had a very short training program. So we're talking about school supervision.

Thai educational leaders concluded that educational quality could be improved if supervision were strengthened. Four different strategies were initiated to strengthen supervision: clusters, testing, principal in-service training, and incentives programs. Each of these deserves review.

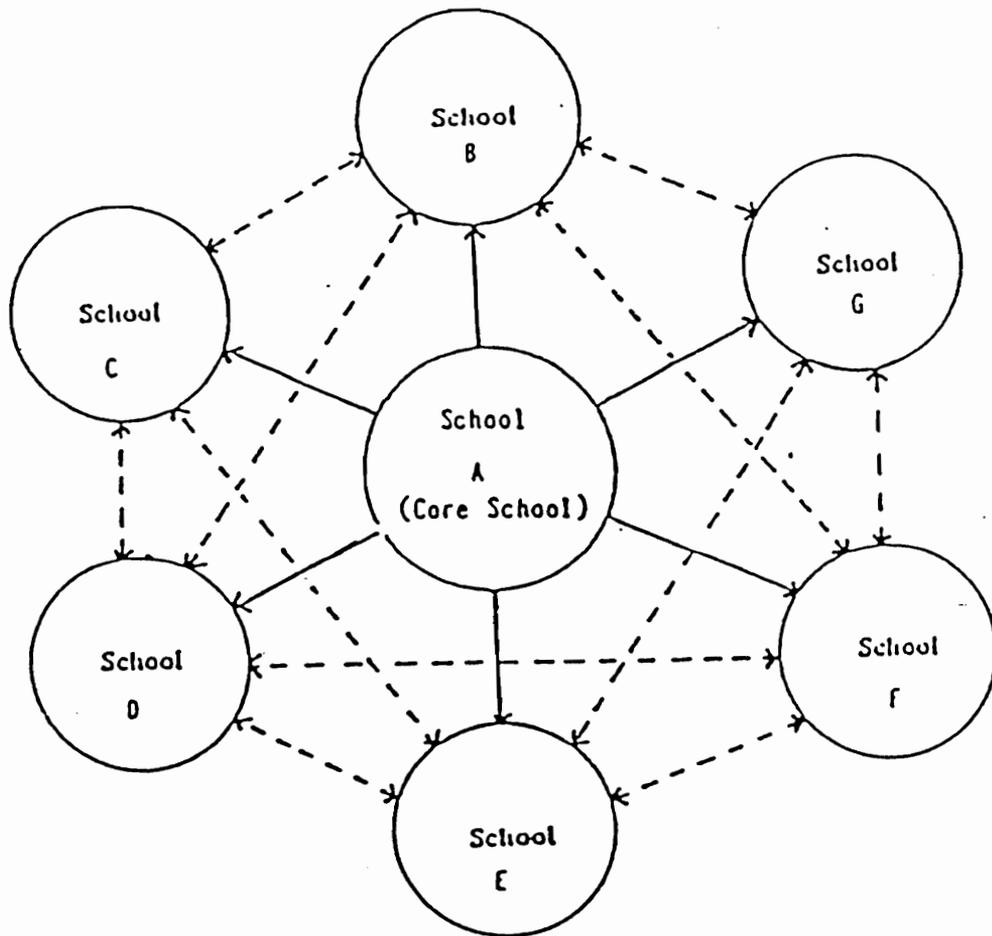
1. Clusters. Clustering is a strategy to link dispersed and isolated schools together so that they can share experience and resources. Mark Bray,² who has reviewed strategies for clusters in a number of societies, presents the following diagram of a typical cluster (see Diagram 2 on page 6).

Overhead 2

² Bray, Mark, School Clusters in the Third World: Making Them Work (1987).

Diagram 2

A Common School Cluster Model



———— supervisory/controlling linkage
----- coordinating linkage

While the school in most societies is related vertically to a district or regional office with little contact with nearby schools, in a clustered system the horizontal ties between schools are encouraged. These ties may focus on:

- a. athletics,
- b. sharing books,
- c. exchange of teachers to cover certain specialties, and
- d. association of principals to plan joint activities.

In Thailand, clusters were first formed in the 1950s, and by the late 1970s, each rural cluster was equipped with a learning center that had special equipment and specialists in pedagogy. The major new positive development was the focus of many clusters on staff development.

2. Testing. A national test of academic performance for sixth grade students was introduced, and the tabulations of results were developed by district, school and teacher. These results were used to spot districts and schools that were both exceptionally high or low. Those with low performance were called to meetings where the responsible individuals had to explain the results and participate in discussions about ways to improve the situation. Those educational supervisors who were unable to bring about improvements in their schools were pressured to find new jobs.

3. Principal In-service Training. To assist those principals who wanted to improve their schools, an in-service program was developed. This involved an orientation, an intensive five-day course, and a follow-up. This in-service program focused on six topics: academic development, personnel, general clerical and finance, student affairs, building and facilities, and the relationship between the school and the community.

4. Incentives. The incentive schemes focus mainly on teachers. They strive to reward teachers whose students do well with salary increments and those teachers who work in difficult areas with hardship pay. The implementation of these incentives would not be possible if Thailand's educational system had not introduced a sound system of testing.

The BRIDGES research suggests that these reforms tend to improve the accountability of schools, but sometimes have the negative effect of encouraging unhealthy competition. However, the quality of education in Thailand would appear to have improved considerably since the introduction of the reforms (see Diagram 3 on page 8).

Diagram 3

Student Achievement on the National Sixth Grade Examination 1984-87
by Percent, and Satisfactory Achievement by Percent

Subject Area	Mean Scores				Percent Attaining Satisfactory Achievement			
	1984	1985	1986	1987	1984	1985	1986	1987
Thai	49.08	56.84	58.40	56.29	47	69	76	64
Math	33.11	36.52	47.81	46.16	11	18	41	40
Life Experience	44.01	45.69	54.48	50.79	30	37	65	52
Work-Oriented	55.28	57.60	65.83	62.13	55	60	81	67
Character Development:								
1. Attitude/Feeling	2.88	2.87	2.94	2.91	88	89	92	92
2. Habits	2.14	2.23	2.33	2.30	90	92	96	94
3. Strength	1.65	1.66	2.14	2.06	54	52	86	96
4. Weight	2.42	2.44	2.49	2.08	92	93	94	98
5. Height	2.28	2.27	2.32	2.05	93	93	95	98

Source: ONPEC, 1987, pp. 8-9.

Sri Lanka

Sri Lanka is a much poorer society than Thailand, but it has achieved remarkable success in expanding its educational system over the several decades of independence. Currently, nearly all school-age children are enrolled in basic education, and many go on to advanced education. An interesting feature of the structure of many of the older schools in Sri Lanka is that they combine several grade levels. For example, one school may range from kindergarten straight through to the collegiate level. Such comprehensive schools tend to be very large, and in some instances, may enroll over 4000 students. On the other hand, there are many small schools (nearly 40% of the total number of schools) that enroll fewer than 100 students. The large schools are usually located in the urban areas, and the small schools in the rural areas. However, in many rural areas it is not uncommon to find schools of intermediate size near a number of small schools.

System-level Reforms

From the late 1970s, Sri Lankan educators came to recognize their achievement in expansion and began to focus on disparities in educational quality of the large and small schools, as well as the deficiencies in management systems. What eventually emerged were a series of management reforms that were introduced during the 1980s. The period during which the management reforms were introduced was also a period of social turmoil. The Sri Lankan economy faltered, and thus, there were limited funds to support the reforms. Most reforms, therefore, consisted of a reorganization of existing arrangements rather than the introduction of new facilities or personnel.

1. **Clusters.** As in Thailand, Sri Lanka introduced clusters. In Sri Lanka, additions such as learning centers were not considered. Clusters were formed when smaller schools combined with a well equipped larger school with the expectation that all schools would share resources. The cluster schools were expected to initiate collaborative in-service training along with teacher exchanges, interlibrary exchanges, and the development of joint athletic teams. The specifics of each cluster's program were directed by the principal of the largest "core" school and a cluster coordinating committee. Sometimes, a "core" principal would be assigned a deputy principal to help share the extra duties.

2. Division. In the past, supervision of each school had been done by a small number of circuit offices headed by circuit officers. The typical circuit officer was responsible for 50-100 schools, and usually did not have the time to make even one visit in three years. The decision to dissolve the old circuit offices was part of the management reforms. In some areas, the cluster became the sole means of ground-level supervision, with core principals reporting to the district office. In other instances, a new division office was established with three or more educational officers and related staff. The division office, in the original plans, was to take responsibility for educational supervision, teacher transfers, basic maintenance of facilities, planning, and other educational functions. This plan was never fully realized in any area. However, some division offices did assume several of these functions. With a greater volume of expertise in a single local office, the division offices were able to provide more effective service to schools and clusters than the former circuit office.

3. District/Provincial Office. At the time of the reforms, central administration was effected through 26 regional (later called district) offices. A first step in the reform was to change these offices so that they placed more emphasis on planning and educational development. Towards the end of the reform, several of the district offices were consolidated into ten provincial offices (see Diagram 4 on page 11).

Overhead 4

These management reforms can be summarized in terms of four administrative models as illustrated in Diagram 4. What stands out in the comparison are the differences in the respective spans of control and numbers of levels of the respective systems. [Organizational theorists tell us that the ideal span of control in a management system is about six to ten subordinates, less than six leads to excessive supervision, and above ten leads to difficulties in maintaining even quality in supervision.] On the other hand, low spans of control sometimes lead to more hierarchical levels, and a possible decline in the quality of communication (see Diagram 5 on page 12).

Overhead 5

During the course of our research, only the first three models were deployed. The first came to be called the **pre-reform model**, the second the **classical cluster model**, and the third the **division/cluster or modified cluster model**. As illustrated in Diagram 5, both cluster models achieved much better lateral communication than did the pre-reform model.

Diagram 4

Comparing Span and Control and Levels of Different Ministry School Linkages

Span at Each Level for the Four Approaches: ⁹

	Pre-Reform	Cluster	Division/ Cluster	13th Amendment
--	------------	---------	----------------------	----------------

Level A
(Ministry)
to Level B:
Region
District
Province

	26		26	
		26	26	10

Level B
to Level C:
Circuit
Division

	3-5			
			4-6	6-10

Level B or C
to Level D:
Cluster

		30-50	7-15	7-15
--	--	-------	------	------

Level C or D
to Level E:
School

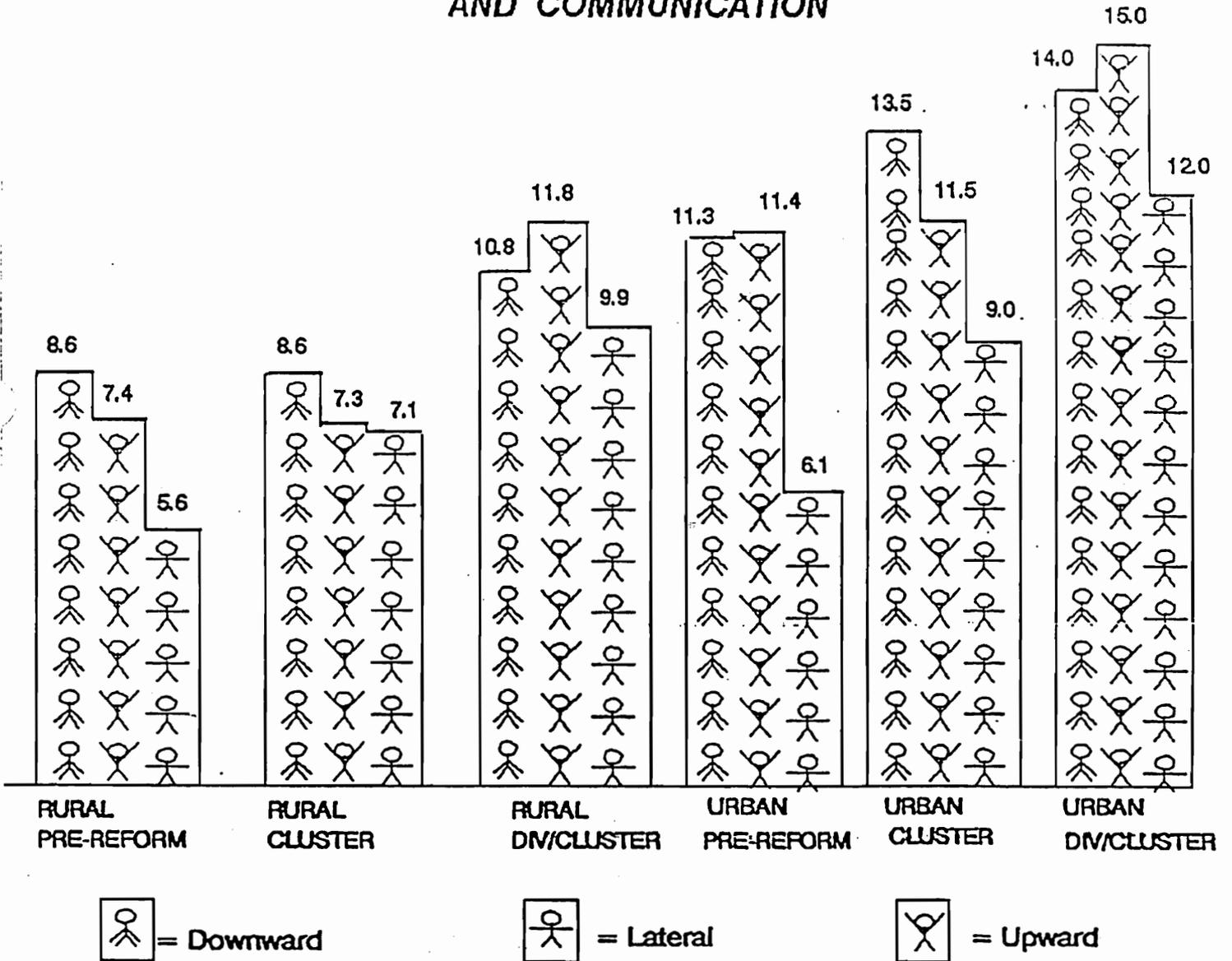
	50-100	7-12	7-12	7-12
--	--------	------	------	------

Number of
Levels

	4	4	5	5
--	---	---	---	---

Diagram 5

MINISTRY-SCHOOL LINKAGES AND COMMUNICATION



The division/cluster model also achieved better vertical communication (both upwards and downwards). These effects are more uniform in the rural areas which was the area of greatest concern for the reformers (see Diagram 6 on page 14).

Overhead 6

The management reforms, as illustrated in Diagram 6, also enhanced the sharing of resources between schools and the frequency of holding in-service seminars for teachers.

The research report goes on to show that the reforms appear to have stimulated improvements in the quality and efficiency of schools (though the final verdict on these outcomes will have to wait until more time has passed).

School-level Reforms

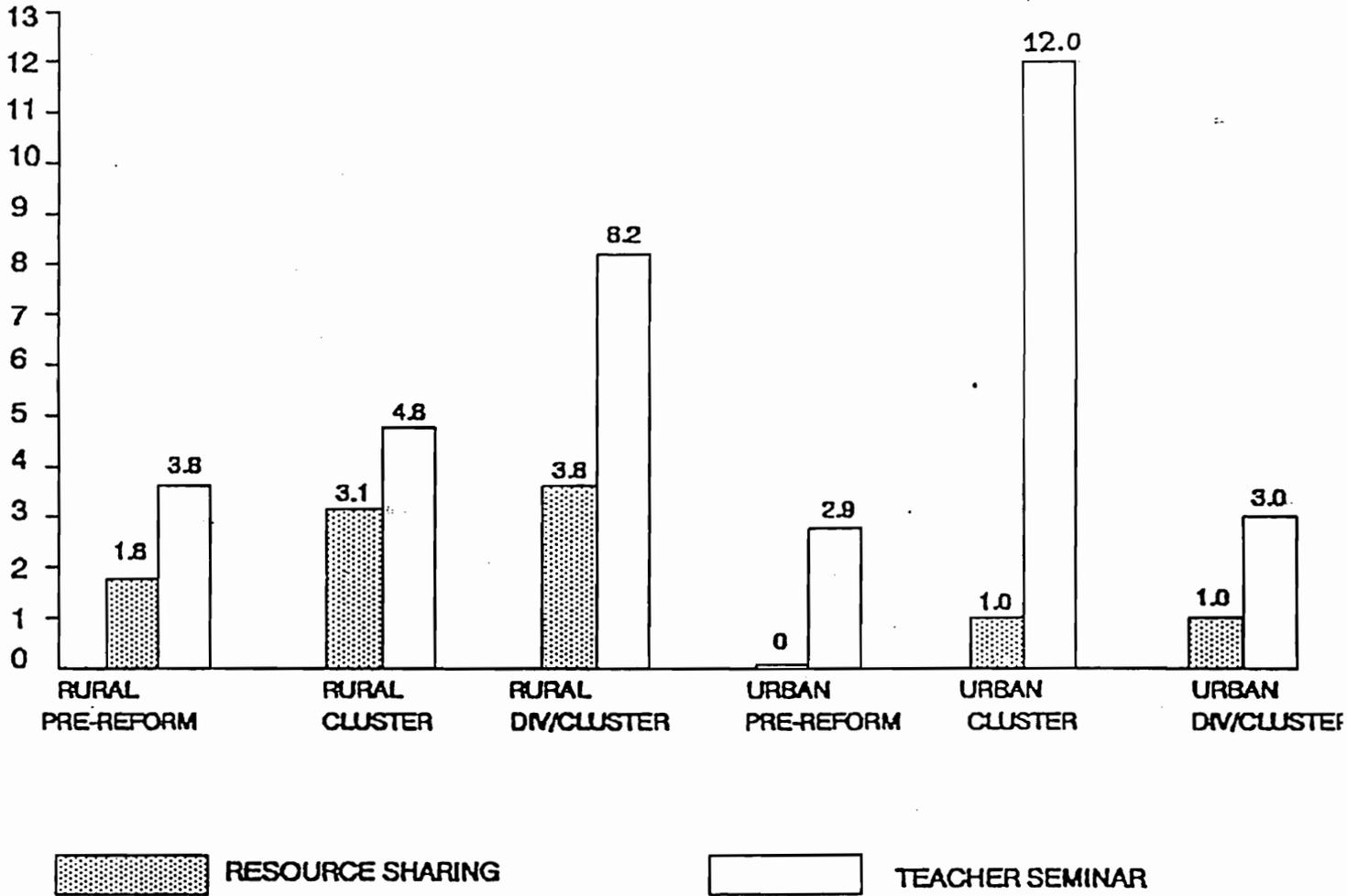
A second thrust of the Sri Lankan reforms was to transform the roles of principals. According to the original reform report, no longer was the principal "too content to do administrative work" such as "attending to the admission of children" or providing "pay to the teachers at the end of the month." Rather, the principal was to become a first line manager who would become active in instructional management, and in the enlistment of community support for the school and the students.

As in Thailand, a program of training was developed and a large proportion of principals attended this training program. Those principals who participated in the program tended to manage their schools differently. Those who placed their greatest emphasis on instructional management tended to get the best results in terms of student attendance and achievement. The impact of training was greatest in the schools that were members of smoothly operating clusters.

An important theme in the Sri Lankan research was the differential impact of the reforms. The old established schools seemed to receive the greatest attention from the reforms, but gained the least benefit from the reforms. The most isolated schools seemed to gain the most benefit from the reforms in those relatively rare instances when the reforms reached them. The important point is that reforms are rarely implemented on a uniform basis, and the pattern of implementation may reflect long-standing interests that are not fully consistent with the goals of the reformers. While the impact of the reform was uneven, it appears to have led to significant improvements in Sri Lankan education.

Diagram 6

*Ministry-School Linkages
& Incidence of Resource Sharing
Cooperative In-service Teacher Seminars
in Schools*



Conclusion

Management reform is a promising policy option. The costs are modest, and can result in significant improvements in equity, quality, and efficiency of education. However, a uniform approach of decentralization is inappropriate. With respect to resource areas and the weaker sectors of the school system, centralizing reforms may be appropriate. In other situations, decentralizing reforms may be appropriate. The development of a centralized or decentralized option needs to receive careful consideration with regard to the context.

ACTIVITY (1)

What is the situation in your country?

Take five minutes and have the participants answer the questions from Overhead 1. Then start a brief discussion to determine their views about the preferred level of decision-making for various processes in their society. In most instances, participants will be critical of existing arrangements. Wrap up the discussion by acknowledging their questioning attitude, and then note how useful it would be to know what other societies have found works best in terms of decision-making.

Selected References

- Bray, Mark. School Clusters in the Third World: Making Them Work.** Paris: UNESCO-UNICEF Co-operative Programme, 1987.
- Cummings, William K., G. B. Gunawardena, and James Williams. Management Reforms and the Improvement of Education in Sri Lanka.** BRIDGES Working Paper, Feb., 1990.
- Rondinelli, Dennis A. "Government Decentralization in Comparative Perspective: Theory and Practice in Developing Countries." International Review of Administrative Sciences 2 (1981): 133-145.**
- Schwille, John, et al. Recognizing, Fostering and Modeling the Effectiveness of Schools as Organizations in Third World Countries.** BRIDGES Working Paper, August, 1986.
- Winkler, Donald. Decentralization in Education: An Economic Perspective.** August, 1987.
- Wheeler, Christopher W., Stephen Raudenbush, Aida Passigna. Policy Initiatives to Improve Primary School Quality in Thailand.** BRIDGES Report Series No. 5, June, 1989.

**Policy Initiatives to Improve
Primary School Quality
in Thailand:
An Essay on
Implementation,
Constraints, and
Opportunities for
Educational Improvement**

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Foreword

Research and policy analysis can make an important contribution to the design of policies to improve education, but their eventual impact and efficiency depend on how they are implemented. Although managers of education systems have always been concerned about implementation, their perspectives have changed over time. Between 1950 and 1975 most countries chose centralized planning as the most effective way to achieve development goals. The timely supply of personnel and physical materials was the major concern of management in education systems. Little or no attention was given to how supervisors, headmasters, and teachers actually carried out educational policies.

Plan after plan failed. At first the assumption was that the quality of planning had been poor, and renewed effort went into technical advances in planning. Later it became clear that most plans had not been carried out as written, that assumptions about the capability of supervisors, principals, and teachers to implement programs were mistaken. The major problem of education management was now defined as the motivation and training of those who actually implement plans. Some central planners erred by emphasizing goals and methods and ignoring the actual process of education. Some of those who attacked planning erred by insisting that process is everything, that specification of content is unimportant.

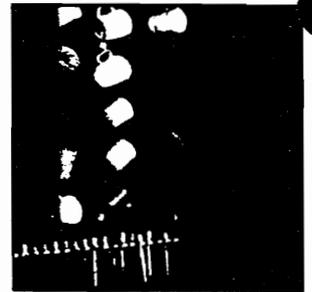
Both perspectives are partial views, not only because both planning and process are important, but because there are other factors that must be taken into account for implementation to succeed. Managers have to recognize the important contributions to implementation made by those affected by education (not just students, teachers, and principals, but also parents, communities, employers, and political parties). Education operates in a social context, and must be articulated with it. The task of articulation is difficult, because of competing demands made upon the education system. Some of those affected by any given education policy may be beneficiaries, in the sense that the outputs of education help them achieve their objective. But other

groups may believe they are affected negatively, and act to block implementation.

What we require, therefore, is a framework for understanding the dialectics of implementation of education policy. On one hand, implementation requires commitment from the leaders of the country; on the other hand it requires commitment from their followers. Implementation requires inputs and must generate outputs. The inputs must be distributed, and the outputs must be seen as received. Implementation requires mobilization of those who will be served (e.g., the community), and those who will serve.

Each of these dyads develops in a dynamic context in which success in one moment creates condi-

Education operates in a social context, and must be articulated with it. The task of articulation is difficult, because of competing demands made upon the education system.



tions that in another moment limit achievement of objectives. The clarification of goals required for political commitment focuses opposition. The allocation of resources stimulates competing demands. The mobilization of the implementors (teachers and principals) takes their attention away from other important tasks. Mobilization of beneficiaries (employers, community, and students) creates expectations which, when not immediately met, lead to lack of support. As expectations are met, there is an escalation of expectations, which creates new demands on the system.

This paper contributes to our understanding of implementation at the level of the classroom. Wheeler, Raudenbush, and Pasigna focus especially

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on the tension between accountability as a mechanism for management, and on capacity-building as a mechanism for mobilization. By accountability they mean the imposition of norms and goals, and the use of external assessment devices to insure that these norms and goals are being followed and met. Accountability is a centrally imposed device, linked closely to planning.

Capacity-building includes training, but also the development of forms of governance in which principals and teachers have more choice not only about how they will pursue objectives, but also about which objectives will be pursued. Through capacity-building teachers increase their autonomy, which is expected to result in enhanced sensitivity and creative response to varying local conditions.

Both accountability and capacity-building are necessary for effective teaching, but as a system develops, the balance point between them can shift. What was acceptable practice (for example, with respect to intensity of supervision) in one stage is now rejected by teachers as inappropriate. At the same time, at the national level, political trends push the central system to demand more from teachers.

Through a detailed analysis of various innovations in the education system of Thailand, the authors illustrate some of the various forces that can operate to effect the implementation of education policies. The paper compares innovations aimed directly at the teaching-learning process in the classroom, and those intended to affect learning through improvements in school management. Within each of these kinds of innovations Wheeler, Raudenbush, and Pasigna identify efforts to increase accountability, and efforts to increase capability. They show how resolution of the tension—between the development of teachers as highly-skilled autonomous professionals, and the desire of system managers to monitor school performance—leads to improved quality of education.

The balance point in Thailand is not, the authors point out, that which will be most effective in other cultures. They comment on how Thai culture tends to dispose many persons to favor central control. But there is a balance point, and understanding the tensions inherent in program implementation can enhance our capacity to improve the quality of education.

Noel F. McGinn
June 6, 1989

Executive Summary

Like other developing nations, Thailand in the past 25 years has dramatically increased access to education, and, like other countries, now faces the pressing need to improve quality, especially at the primary level.

In Thailand, improving the quality of teaching and administration represents the key to improving primary school quality. Teachers are an underdeveloped resource in relatively large supply compared to other resources such as facilities, equipment, or textbooks. Principals play a pivotal role in creating and fostering a school-wide atmosphere for effective learning. Given the need to improve schools with scarce resources, reforms that better utilize the existing staff are generally more promising than reforms that require the hiring of additional staff, rely on expertise not readily acquired by the existing staff, or require large outlays of money for new equipment or facilities.



Teachers are an underdeveloped resource in relatively large supply compared to other resources such as facilities, equipment, or textbooks.

This paper raises important questions for policymakers in Thailand and provides the following answers:

• **What types of policy initiatives have been used to improve primary school quality in Thailand?**

Some are clearly designed to make teachers and principals more accountable, that is, to focus their attention more on the academic tasks of schooling by using regulations, requirements, and hierarchical patterns of decision making and control to improve the quality of education. Others are more clearly designed to build teacher and principal capacity in

terms of knowledge, and to stimulate quality instruction and administrative leadership as a means to accomplish the same goal. Collaboration, cooperation, and participation characterize these initiatives. The national testing program illustrates the accountability approach, while interactive staff development programs illustrate the capacity-building approach.

• **What have been the results of initiatives to improve primary school quality?**

Based on an examination of nine important initiatives enacted during the late 1970s through the mid-1980s, three patterns of implementation emerged. The first involves initiatives that were not effectively implemented, achieved no demonstrable success in improving school quality, and were subsequently discontinued. The second pattern involves only partially implemented initiatives which produced little or no demonstrable effect on quality, but continue to enjoy government support and are presently undergoing modification in hopes that their implementation and results will improve. The third pattern involves vigorously implemented initiatives that have made demonstrable contributions to quality.

• **Can we identify factors which increase the chances of implementation success?**

For "successful" implementation, we required, first of all, that the new techniques, materials, or concepts central to the initiative actually be used by teachers in classrooms or by principals in their schools. Second, we required that once used, the initiative actually contribute to the desired result.

Using these criteria we found that strong, united central government support, especially by the Office of the National Primary Education Commission (ONPEC), was important if initiatives were to result in changed behavior. Depending on the type of policy (capacity-building or accountability) we found that either active involvement by those directly affected was important or that the central government had to mobilize and use a wide array of sanctions and incentives if teachers and principals were to actually use what was taught or mandated. Some policy initia-

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tives failed to meet these two tests with the result that they were either dropped or are now undergoing major changes in hopes of improving the likelihood that they will actually be used.

Regarding the second criterion, desired results, we found that the smaller implemented subset achieved desired effects if its content actually met the needs of those affected and, for capacity-building initiatives, if the "participatory" social relations that characterized the implementation process appeared subsequently to be mirrored in the social relations of the classroom where children participated actively in learning. For accountability policies, not only did the content have to meet the needs of those affected, but they also had to be implemented in a way that was congruent with certain Thai cultural values.

- **What lessons can be learned from policy initiatives about obstacles to the improvement of classroom learning, the difficulties reforms must overcome if they are to be implemented effectivity, and some promising avenues for future policy implementation?**

During the 1980s Thai policymakers successfully pursued two strategies to improve primary school quality. By the late 1980s a series of tensions had emerged between the accountability and the capacity-building approaches. Recent developments suggest the accountability approach is now prominent and may, for unintended reasons, negatively affect the ability of schools to generate long-term, self-sustaining improvement. The challenge of the 1990s may lie in maintaining, even recreating, the balance between the two strategies and resolving the tensions rather than simply pursuing a single approach.

Section I: Introduction

In the past 25 years, Thailand, like other developing nations, has dramatically increased access to primary education. As in other countries, expanded access, coupled with a population boom, diverted attention and resources away from the quality of primary education. As the need for improving quality became more apparent, however, Thailand responded with a number of policy initiatives, particularly during the late 1970s and 1980s. This paper analyzes these initiatives by reviewing the available literature in English, supplemented by interviews with key Thai officials responsible for the implementation of these reforms and preliminary results from current research underway sponsored by the BRIDGES* project. Specifically this paper addresses the following questions: What kinds of policy options are available for improving primary school quality? What initiatives have been tried? With what results? Given the changes that have been tried, are there identifiable characteristics for the implementation process that explain and predict implementation success? What lessons can be drawn about how to overcome obstacles to improving quality, especially those which any initiative might have to overcome? What are the most promising avenues for action?

A History of Increasing Access to Education

The period of most dramatic educational reform in Thailand falls between the decades of 1960 and 1980. Certainly, earlier periods are important. For example, King Chulalongkorn, a dynamic and exceptionally able monarch, proclaimed his intention in 1874 to extend educational opportunities to all social



Thailand's very success in creating universal access to primary school brought to the forefront another concern: the quality of instruction.

classes, created a Department of Education in 1884, and developed a national plan for education by 1895 (ONPEC, 1984). By 1921 compulsory primary education had been mandated for all children. The infrastructure in terms of teachers, principals, buildings, and textbooks, however, was lacking, which meant this important policy initiative existed more on paper than in practice for the next 40 years.

While the legal basis for Thailand's educational achievement in primary education had been created by 1921, its realization (universal attendance) came only during the decades 1960-1980 as shown by the percentage of students who actually attended and completed primary school. For example, in 1960, of those 25 or older only 33.5% had completed four years of primary school; by 1980 the figure had risen to 69%. The most remarkable fact, however, is that expanded participation occurred at the same time that Thailand's population was nearly doubling—from 26 million to 44 million (Wyatt, 1984). Not only was educational opportunity expanding, but it was expanding exponentially. Currently 96% of every age cohort is enrolled in primary school.

History, however, is full of paradoxes. Thailand's very success in creating universal access to primary school brought to the forefront another concern: the quality of instruction. To accomplish equality of access required a dramatic increase in the infrastructure of education: more buildings, more textbooks, and more teachers. Valenti (1979) points out that in the early 1960s 5,000 to 6,000 new teachers were graduating each year from teacher training programs; yet the need was for 8,000 to 10,000 a year. "Assuming a pupil/teacher ratio of 35/1 in primary schools and a ratio of 20/1 in secondary schools," he argued, "the teaching force would have to increase from 183,000 in 1967 to 400,000 in 1987" (p.72). By the mid-1980s, the teaching force for primary schools reached over 330,000 (Amornvivat, 1986). The number of graduates from teacher training institutions doubled and doubled again as newly created teacher training programs began providing graduates by the tens of thousands (by 1970, 31,000 teachers a year were graduating from teacher preparation

* Basic Research and Implementation in Developing Education Systems, Harvard University.

programs). But the largest increase occurred as a result of candidates passing through the "external examination system" (Valenti, 1979). While this examination system was roundly criticized by educational leaders and Ministry of Education officials alike as woefully inadequate for ensuring that competent teachers entered the classroom, programs of teacher education, particularly the newer ones, also received their share of criticism. Although one can argue about which program produced the least competent teacher, the fact remains: a significant percent of new staff lacked adequate pedagogical skills and sufficient content knowledge.

During the 1980s, the problem of teacher competency took on an added dimension as government family-planning initiatives took hold and the population growth rate fell from 3.2% in the 1960s to less than 2% in the early 1980s (Krannich, 1980). The mid-1980s saw fewer students enrolled in primary school. This reduced the demand for new teachers and made the need for improved teaching even more apparent as teacher/student ratios plummeted to less than 20 to 1 in many classrooms without appreciable gains in student performance. In 1984, for example, the Office of the National Primary Education Commission (ONPEC), the agency responsible for administering about 85 percent of the primary schools in Thailand, assessed pupil achievement and found that mean test scores were lower than the 50 percent standard required by the government in almost all subjects (Bhumirat, et al., 1987). Clearly for the foreseeable future the teaching force represents an underdeveloped and underutilized resource for improving the quality of primary education.

Improving the teaching-learning process by improving the quality of teaching in classrooms, however, represents only one possible avenue of productive reform. Teaching occurs in an organizational context, as studies of effective schools in the United States and Third World countries have demonstrated (see Schwille, et al., 1986). Administrative policies and procedures play a crucial role in creating or destroying the preconditions for effective teaching. The massive expansion of the primary system necessitated not only hundreds of thousands of new teachers but also thousands of new administrators. Most of these new principals were simply promoted in their positions from the teaching ranks and few, if any, had received training for their new responsibilities. The organizational context of schooling therefore represented a second major area of possible fruitful reform.

In short, current problems, as Cohen and Neufeld (1981) argue, are often connected to past problem-solving efforts. Paradoxically, as Thailand "solved" one problem, that of actual access to primary school, the strategies used made salient a new, more vexing problem, which was how to raise the quality of classroom instruction. The late 1970s and early to mid-1980s have been devoted to reform initiatives in this area, which provide the focus for this inquiry.

Office of the National Primary Education Commission (ONPEC)'s Reform Initiatives

From 1980-1988, the Office of the National Primary Education Commission (ONPEC) expanded existing programs in various provinces to the national level, reformed existing programs at the national level, and implemented a series of new innovations (Interviews, March 1987, October 1987, and June 1988). The scope of these efforts included: a national school lunch program (involving community participation) to address problems of student malnutrition; a pre-primary education program to address problems of student readiness; a number of assistance programs such as lending bicycles, providing transportation allowances, establishing school bus and ferry transport services to increase student accessibility to grades five and six; support for curricular innovations such as the Reduced Instructional Time Project (RIT) (designed to help teachers instruct students of diverse ages and competencies in small rural schools); staff development programs to improve teacher competencies in subject matter and pedagogy, as well as programs for selected "master teachers" (academic cluster teachers); programs to improve principals' knowledge of their administrative responsibilities, including monitoring teacher performance in classroom teaching; programs to improve district and provincial staff knowledge of their administrative, financial, and personnel responsibilities; programs to improve parental knowledge of school activities and to stimulate community involvement in school decision making; programs to stimulate student participation in school life; a national testing system to monitor and improve student achievement; a series of organizational reforms to decentralize decision making to provincial offices, district offices, and local school clusters to stimulate local efforts at school improvement; the creation of libraries and resource centers in school clusters to improve the development and use of instructional materials; and various changes in the financial in-

centives for teachers to reward academic success by using it as a criterion for merit promotions and transfers to other schools. (See Kunarak, 1987, for a more detailed description of these initiatives).

The purpose of this paper is not to examine all of these initiatives. There is a difference, we believe, between reforms which indirectly improve the quality of classroom teaching, and those that have a more direct effect on what teachers do in classrooms. Transporting children to school, feeding them lunch, combining age cohorts to create viable class sizes, pursuing drop out prevention programs, developing school democracy programs, and organizing available instructional materials are all important. But each creates only the preconditions for teaching. The initiatives we shall examine are aimed at directly influencing what happens once the children are in school, in the classroom.

Thus we shall not examine a number of initiatives, in themselves important and for the most part highly successful in both their implementation and their effects. For example, the bicycle lending program noted above has proven highly successful in enabling grade four students from very small primary schools to complete their last two years at a neighboring village (ONPEC, 1984; Bhumirat, 1984). School lunch programs have played a critical role in reducing malnutrition (affecting up to 30 percent of Thai youth), in increasing physical and intellectual health, and in stimulating greater community involvement with and support for primary schools (ONPEC, 1984).

The initiatives we have chosen to analyze directly affect the organization of academic instruction in the school and the delivery of academic content in the classroom. Once children are in school, organizing and delivering quality instruction, we believe, become the key issues. If the school fails here, nothing of substance occurs. If the methods of organization or instruction fail to produce gains in student learning (or some other goal), then the policies have also failed.

Specifically the paper addresses the following questions:

- **What have been the results of initiatives designed to influence the teaching-learning process in the classroom and how schools are structured and managed?**

- **Can we identify factors that seem to increase the chances of implementation success?**

- **What lessons can be learned from reform initiatives about obstacles to the improvement of classroom learning, the difficulties reforms must overcome if they are to be implemented effectively, and some promising avenues for future policy implementation?**

The analysis rests on two assumptions regarding "successful implementation." For the teaching-learning process, new techniques, materials, or subjects must actually be used in the classrooms. Second, the attainment of some goal (i.e., more learning, greater retention, etc.) or goals must be associated with changes in teacher and student behavior.

For the school management process, three conditions must be met for "successful implementation." First, an initiative must actually influence the ways in which schools are managed, i.e., the ways principals and supervisors act. Second, these changes must affect students. Our view is that such changes will generally occur indirectly, primarily by affecting classroom practices. Third, the resulting change in classroom process must lead to the more satisfactory accomplishment of some goal (i.e., student learning).

Implementation failures at one level mean that the techniques, materials, or concepts central to the reform were never applied. Teachers never touched the new text; principals never used the new management techniques. Implementation failure, however, can occur at a second level, that of theory, which means simply that the new approaches were tried but did not work.

Hence, evaluating a set of initiatives means evaluating each phase. Was the policy implemented? (i.e. Did teachers use what they learned in the classroom? Did principals use what they learned to manage their school?) If so, did it have the desired effect? If the first question is not answered affirmatively, the second need not be asked.

Finally, a word is in order about the methodology of this study. It was originally conceived as a literature review of policy initiatives in Thailand available in English journals. Its purpose was to provide a team of U.S. researchers with background knowledge of policies affecting primary schools, so they could better assist their Thai colleagues in defining a set of studies on the factors that determine primary school quality. The specific methods for these studies use three research strategies: survey, cost analysis, and field studies. (The BRIDGES/Thailand research project). Comments on earlier drafts, the opportu-

nity to interview key policymakers at the national, provincial, district, and school levels, and an increasing understanding of primary schooling gained from site visits in different regions of Thailand, led us to modify the scope of this paper by focusing on analysis rather than description. Most of the results we report

are available in English; some are from studies done in Thai, some from interviews with key policymakers, and some from preliminary findings from systematic evaluations currently in process. We indicate in the text the sources we used.

Section II: Initiatives to Improve Classroom Teaching and Their Long-Term Consequences

In Thailand attempts at improving the teaching-learning process include Reduced Instructional Time (RIT), the 1978 curriculum, and a set of teacher inservice initiatives. RIT, initiated in 1977, is an instructional system that includes materials, a management system, procedures for evaluation, and a philosophy of education that integrates its various components. The 1978 curriculum replaced a thoroughly outdated curriculum that had been adopted in 1960. Conceptual understanding and student involvement in learning were two goals of the reform. Teacher inservice initiatives have ranged from single sessions on a topic, to multiple sessions on a topic, to requirements for additional coursework in a number of areas. Efforts to reform the school management



Expansion requires choices, especially in terms of resources.

process have included a national testing system for sixth grade students and a subsequent set of district and school cluster testing initiatives for all students in every grade each term; an inservice training program for all principals; new entry-level requirements to become a principal; changes in the authority of school clusters; and certain incentive programs.

Teaching-Learning Process

Reduced Instructional Time (RIT)

RIT is a complete instructional system. Its principal components include instructional materials based on the 1978 curriculum, a management system designed to ensure the efficient use of these materials, evaluation procedures, and a philosophy of education that integrates its various components. The highly structured instructional materials or "learn-

ing packages" are self-contained – i.e., they specify *what* is to be learned (content) and *how* it is to be learned (procedures). The management system provides many opportunities for group learning and peer group activities. Evaluation procedures make use of predesigned criterion-referenced tests that are built into the learning packages.

The goal of RIT is to provide an effective and efficient (therefore, economical) mass primary education by reducing the amount of time spent in direct instruction and student-teacher interaction, and by increasing student involvement in directing the learning process (Project RIT, 1978). It is argued that more students reach higher levels of competence, and do so at reduced per-pupil cost than under the conventional, teacher-centered system. Launched during a period of relative teacher shortage, RIT is specifically designed for classrooms with high student-teacher ratios (Nichols, 1980). By the mid-1980s, when the teacher surplus became a problem for many primary schools, RIT was used mostly in small, remote, rural elementary schools in Thailand where teachers continue to be in relatively short supply.

RIT was initiated in July 1977 as a joint project of the Southeast Asian Ministers of Education Organization (SEAMEO), through its Regional Center for Innovations and Technology (INNOTECH), and the Department of General Education of the Ministry of Education in Thailand. From 1977 to 1979 both INNOTECH and the Ministry of Education provided financial support to the project (Project RIT, 1984). After 1979 the Thai government continued to provide the funding needed to carry the project through a two-phase experimental stage (1979-1981 and 1982-1983) into the current level of implementation. Try-out and experimental data for 1977 to 1982 (Project RIT, 1984) show that RIT accomplished the following results:

- higher levels of achievement among students using RIT instructional materials and procedures than among those using regular textbooks and taught by traditional methods (i.e., predominantly teacher-directed);

- greater equality of opportunity for quality education for students as evidenced by increases in achievement in small RIT schools to levels that matched those of large RIT schools; and
- a positive cost-effectiveness ratio as a result of the reduction in student-teacher interaction time leading to a reduced need for teachers – a savings that more than covered the expense of providing RIT materials and training teachers to carry out the program.

Given its success during the tryout and experimental stages, the government expanded the implementation of the RIT system from an unspecified number of small primary schools in seven provinces in 1982 to 6,800 schools in 72 provinces in 1988 (Interview, July 1988). This expansion, however, has generally been limited to “very small” schools with enrollments of 120 or less where teachers usually have to teach multi-grade classes.

RIT was implemented at the classroom level during its experimental stage (relatively controlled conditions in an unspecified number of small rural primary schools in seven provinces). When implemented, greater student learning occurred. It remains to be seen whether this level of effectiveness can be maintained as RIT is introduced into more schools. Expansion requires choices, especially in terms of resources. As will be shown later, several important decisions have already been made which may affect the long-term impact of the initiative.

The 1978 Curriculum Reform

Widespread dissatisfaction with the 1960 curriculum led to its replacement in 1978. The major criticisms were: rigidity of the course content, excessive emphasis on a strict academic orientation, and a teaching-learning process that emphasized rote memorization (ONPEC, 1984). The new curriculum, implemented grade by grade over a six year period (1978-1983), replaced the old method of teaching subjects separately with a design (see Table One, p. 9) that grouped subjects under four areas for students in grades one to four, and a fifth for students in grades five and six: basic skills (math, Thai language); life experiences (health education, social studies, science); character development (art, music, physical and moral education); work-oriented subjects (home economics, carpentry, agriculture, and handicrafts);

for students in grades five and six, a set of elective courses under the general heading of “Extra Experiences” (hours were added to the school day for those subjects which explains the 120% compared to grades one to four). Each heading was to receive a certain ratio of instructional time which changed as a student proceeded through primary school.

Table One: Allocation of Time to Subject Areas Under 1978 Curriculum

Subject Area	Grade:		
	1-2 Percent	3-4 Percent	5-6 Percent
Basic Skills	50	35	25
Life Experiences	15	20	25
Character Development	25	25	20
Work-Oriented	10	20	30
Extra Experiences	00	00	20
Total	100	100	120

Source: Chantavanich, p. 22

Conceptual understanding was to replace rote memorization; self-study and self-involvement were to replace spoon-feeding as the route to knowledge; experimentation and group work were to replace passivity. Central to this new approach to learning was a fundamental change in the teacher’s role: instead of teacher-directed instruction, the primary teaching strategies were guidance, advice, and facilitating (ONPEC, 1984).

A large body of research, including reports by ONPEC itself, shows that this new curriculum has yet to alter the traditional teaching styles of most Thai teachers. Chantavanich (1983) and Wuthisen (1984), in field studies that examined primary schools in the early 1980s, found in the districts they studied that course syllabi, teacher’s manuals, coursebooks, and supplementary readings were almost nonexistent. Where they existed, they often communicated content more suitable to the urban areas than the rural. For example, a content analysis of instructional materials by Supang Chantavanich showed the following unrealistic activities: selecting living room and kitchen home decorations, choosing tablecloths and curtains, visiting dressmaking

shops, deciding on proper ways of ironing materials made of cotton, silk, and nylon, to name but a few. When confronted with expectations to teach such content, many teachers just threw up their hands, arguing that it was impossible to teach such activities in a rural setting. Moreover, no effort was made to describe how teachers might modify their practices to make instruction more student-centered. Finally, whatever materials did exist often arrived long after the term had started, an organizational problem that created a considerable burden for teachers. Not only did they have to teach from whatever materials were available until texts arrived, but once they arrived, teachers had no time to read, reflect, and understand what was supposed to be taught *the next day*. In-service programs typically provided only an orientation to the materials; because they did not cover all the subjects to be taught, such sessions did little to create the understanding needed to teach the new content. As a result, what little change did occur was more because of individual initiative than anything the government did.

While curricular content has improved during the mid-1980s and organizational bottlenecks in the delivery of materials have largely been alleviated, the overall cumulative effect from 1978-1986 has been a failure in policy implementation, i.e., new techniques and materials have generally not been used in the classroom. A number of more recent ONPEC inservice initiatives, however, are designed to improve the ability of teachers to implement this reform.

Inservice Teacher Training

• One Shot Sessions

As government concern in the late 1970s and early 1980s shifted from staffing classrooms to improving the quality of instruction by teachers already in the classroom, single inservice sessions were held on specific topics. While no formal evaluations are available in English, a 1985 ONPEC report on inservice programs concluded that such activities failed to lead to any changes in classroom behavior (ONPRC, 1985). ONPEC has since largely phased out this approach to improving classroom instruction.

• Interactive Model of Inservice

a. "The Improvement of Teaching Efficiency of the Primary School Teachers"

This project, under the direction of Professor Sumon Amornvivat, was carried out by ONPEC with World Bank funding between October 1984 and September 1986. During the last six months of the project, all 338,528 primary school teachers under ONPEC's authority were trained in teaching and learning activities related to the new curriculum.

During training, school clusters were used as sites to reduce costs and time away from classes. The training period had three phases. The first lasted three days. Self-instructional packages were read, "hands on" activities completed, and exercises answered. Specific attention was paid to programmed texts and ways to stimulate effective group participation. The second phase took four weeks and was classroom based. Teachers returned to their respective schools, carried out assignments, and documented results, focusing particularly on strengths and weaknesses of the activities. Phase three, which lasted two days, again took place at the cluster site where teachers presented results of their efforts, participated in group discussions and group evaluations, and completed individual self-evaluation activities. Over 95 percent of the participants expressed satisfaction with this program, and believed it would improve their classroom teaching (Pitiyanuwat, 1986).

Did teachers actually implement what they learned in their classrooms? A follow-up evaluation a year later by a team of researchers (Pitiyanuwat, 1986) found considerable evidence that this had occurred, as Table Two on page 11 demonstrates.

Did the initiative improve student learning? Although many factors could contribute to such outcomes, the initiative correlates with improved test scores, as the section on testing under school management initiatives will show.

b. "School Based" Inservice

In 1985 ONPEC launched a new inservice initiative called "school based" inservice. Two assumptions guide this approach: knowledge learned has to be transformed into action or it becomes useless; knowledge has to be responsive to local needs or it becomes irrelevant. ONPEC defined school based inservice in the following way:

...training activities provided for existing teachers, designed to be responsive to the local needs and organized by the local educational offices or schools or clusters of schools (p. 5).

Table Two: Teachers Who Frequently Used the Teaching-Learning Activities for the Training in Their Classrooms by Percent from Self-Report, Classroom Observations by Researchers and Interviews with Students

Teaching-Learning Activities	Self-Report	Classroom Observation by Research	Student Interviews
1. Activities to prepare students before class	82.59	59.72	98.61
2. Helping students to be prepared	75.82	68.06	97.22
3. Arranging activities for use in the lessons	72.89	94.44	97.22
4. Use of narratives, current events, and stories	55.92	54.17	88.89
5. Use of charts, maps	70.71	98.61	100.00
6. Use of songs	58.39	79.17	98.61
7. Games	43.20	59.72	95.84
8. Demonstrations	42.45	52.78	97.22
9. Experiments	19.20	22.22	80.56
10. Student modeling of vocational roles	31.31	34.72	73.61
11. Performing plays	16.22	9.72	52.78
12. Using case examples	42.31	40.28	79.17
13. Lecture-explanation	64.69	100.00	100.00
14. Discussion	45.88	69.44	94.44
15. Debate	7.84	2.78	26.39
16. Use of group work	53.29	87.50	94.44
17. Invite teachers to give lecture-demonstration	8.38	4.16	19.44
18. Research in the library	43.31	13.89	83.33
19. Heterogeneous grouping practices	62.74	45.83	66.67
20. Support and encourage student involvement	76.80	95.83	95.83
21. Summarize the lesson	82.33	98.61	93.06
22. Provide extra assistance to achievers	56.73	25.00	95.83
23. Review lesson before class	78.18	65.28	88.89
24. Pretest	36.49	33.33	65.28
25. Posttest	72.87	77.78	95.83

Source: Pitiyanuwat, et al., 1986, pp. 248-255.

The emphasis on local initiative runs throughout the program's description: curriculum, training, and assessment are meant to adapt to local needs; local resources are to be mobilized; and local teachers on the core planning team are to act as resource persons throughout the training program. While the goal of this program is to improve the quality of teaching, a number of objectives are also clearly oriented toward improving collegiality and a sense of professional responsibility among teachers. The specific subset of five goals includes the following:

- To upgrade teaching skills and working capability for all teachers in some several [sic] schools.

- To upgrade teaching skills and working capability for every individual teacher.
- To enrich teachers' experience in view of the individual advancement of their professionalization.
- To better teachers' understanding concerning the teaching profession.
- To provide general education for each individual teacher (p. 6).

Finally, there is a clear programmatic thrust to school-based inservice initiatives. While the method

The objective was to establish more administrative control... by holding provincial directors responsible for the results, and then encouraging them to hold districts accountable.

could be used in any subject area, ONPEC has specifically chosen four projects: 1) the promotion of democracy in primary skills; 2) the school lunch program; 3) the promotion of cooperative activities in schools; and 4) health education to promote preventive health care.

While three of the four areas are indirectly related to what happens in classrooms, the programmatic emphasis on cooperative activities in school is directly relevant to the pedagogical deficit that many primary school teachers in Thailand have. Formal evaluations of this initiative are available in Thai on various components of this initiative, but they were not available for this study so we cannot draw conclusions on the extent of its implementation in classrooms or any subsequent effects on student learning.

• **Coursework Models of Inservice**

Supol Wuthisen (1984) describes the Community Based Inservice Teacher Program (CBITP) in rural northeastern Thailand. The roots of the CBITP go back to the Thailand UNESCO Rural Teacher Education Project (1955-1974), the Teacher Training Education Extension Program (1968-1974), and several training programs begun during the period 1973-1975 but terminated in 1976.

The CBITP was designed to provide inservice training for teachers already in classrooms in order to meet local development and educational needs. The program was a joint effort of eight teachers' colleges in the northeastern region. Extension centers were established in schools and local communities. University staff would travel to these centers for three days (usually Friday-Sunday) to hold a series of intensive class meetings. Teachers could earn credits toward their bachelor's degree.

Implementation of the CBITP began just as the administration of primary schools was about to undergo a shift from the Department of Local Administration in the Ministry of Interior (MOI) to ONPEC in the Ministry of Education. Aside from any issues of principle that might have been involved, the MOI was reluctant to give up jurisdiction, given the number of teachers who work in villages throughout the country and the amount of money involved. Since participation in the CBITP courses could lead to a B.A. and increased status, the MOI gave full support to the CBITP as a means for gaining favor with large numbers of primary school teachers (Wuthisen, 1984). Unsuccessful in its effort to prevent the transfer, the MOI reluctantly handed over

the reins to the Ministry of Education at the end of 1981. The effect on the CBITP was immediate and drastic: funds were no longer made available. Instead ONPEC encouraged teachers to attend one of the new open university programs. Such divided administrative support meant that extension centers had to close and a sharply reduced number of courses was offered only on main campuses.

This change appears lamentable. Teachers in rural schools understandably find it extremely difficult to commute to class at a main campus; extension centers were designed to bring instruction to the teacher. In practice, Wuthisen argues, the quality of the courses offered in either place was irrelevant to the needs of the teachers that the demise of the extension centers did not really reduce the quality of the offerings. Ministry of Education officials, especially those in ONPEC responsible for cutting the programs, agree with Wuthisen's assessment of the poor quality of these programs in explaining their decision to terminate funding. They dispute, however, Wuthisen's implication that the programs were not even theoretically defensible. They point out that the programs were designed to provide a means for teachers in teacher training institutions to gain additional income since the salary structure in Thailand requires additional pay for teaching evenings and off-campus courses (Interview, October 1987).

Wuthisen's study was not designed to gather data on classroom use of concepts or pedagogical strategies taught in such courses. The evidence he provides on the quality of the courses as well as the views of the Ministry of Education officials interviewed for this study are sufficient, however, to justify the conclusion that such ideas were unlikely to be implemented in the classroom in other than individual cases. This initiative, in short, was a failure.

Figure One provides a summary comparison of the various reforms directed at teachers.

Figure One: Initiatives to Improve the Teaching-Learning Process

	RIT	Curriculum 1978	One Shot	Inservice	Course-work
Implemented in the classroom	Yes	Generally not (Some individuals)	No	Yes	No
Goal attainment (i.e., improved student learning)	Yes	No	No	Yes	No

All those in the lower third on average scores and those (provincial directors) who had made little or no progress since the previous year were embarrassed and left the conference ready to improve academic achievement.

School Management Process

In this section we examine four initiatives that have the potential for affecting the quality of classroom teaching: 1) the creation of a national test for sixth grade students which subsequently spawned a set of district and school cluster tests for all grades each term; 2) an inservice training program for all principals that included a new set of entry-level requirements to become a principal; 3) the school cluster concept; and 4) certain incentive programs.

A National Test for Sixth Grade Students

In 1984 the Secretary-General of ONPEC asked the Research and Development Division to develop a test for a national sample of sixth grade students. The first year the program began with a pilot in 15 percent of the districts in every province; in 1985 it was expanded to a sample of students in every district and has continued that way ever since.

According to the Deputy Secretary-General at that time (Dr. Rung Kaewdang), the impetus for the test stemmed directly from a need to focus attention within schools on the academic function of schooling (Interview, June 1988). The objective was to establish more administrative control over the thousands of schools that made up the Thai primary education system by holding provincial directors responsible for the results, and then encouraging them to hold districts accountable. In turn the districts would hold schools, principals, and teachers accountable:

The problem was like this: the control of primary school education in Thailand at the time was very, very poor. For example, there were no training requirements for principals. There was little leadership by the principal because when we changed the curriculum, we didn't train the principal. We only had a very short training program for the teachers. So we're talking about school supervision.

If the principal went into the classroom and the teacher asked some key words about the new curriculum, he couldn't answer. He felt if he stayed in the school he would suffer a loss of face or embarrassment, so he moved out of the school to spend his time in the community, at the Ampur or the district. So when I went to visit schools, the problem was that I could not find any principals who

stayed at the school. So teaching was very, very poor. There was no supervision, no monitoring or anything like that...

So if we had a national test we could rank (the provinces). In the first year we publicized the results. This province ranked first on down and the lower ones were unhappy with the result that the test focused their attention more on teaching and learning.

The procedure until 1988 was for ONPEC to host a meeting of all provincial educational directors where mean scores, standard deviations, and two rankings were announced (one with scores for highest to lowest, a second with provinces ranked from highest to lowest based on the rate of improvement from the previous year). Special attention was given to the very best and the very worst of each ranking. Provinces with outstanding scores and those which have achieved dramatic gains make presentations on the strategies they used. During the period of Dr. Rung's tenure at ONPEC each director from a province ranking in the bottom third had a private meeting during the conference with him and key staff from the Research and Development, and Policy and Planning Divisions to discuss the provincial director's specific problems and his/her plans for improving test scores. At that time the agency learned of special needs that might justify additional resources.

During these meetings, the Deputy Secretary-General made mental notes about which provinces needed a personal visit from him to better focus their attention on academic matters (Interview, June 1988). According to other ONPEC officials, these private meetings made the provincial directors "very nervous" (Interviews). All those in the lower third on average scores and those who had made little or no progress since the previous year were embarrassed and left the conference ready to improve academic achievement. Provinces then began to rank districts and to meet with the heads of the district offices on a regular basis to discuss progress. Districts in turn began their own testing systems and began to rank schools and individual classroom teachers according to the performance of their students on tests. It is not uncommon now to find districts allocating additional merit promotions ("double" promotions) to school clusters at the top of the ranking and school principals using test results as one criterion (of many) for recommending merit promotions for spe-

Test results coupled with a national inservice training program for principals resulted in the resignation or voluntary reassignment to teaching of 2,000 principals.

cific teachers.

The results, in terms of higher test scores on the sixth grade national examination, show that schools, principals, and classroom teachers have indeed begun to pay greater attention to the academic task of schooling. Except for 1987 (the most recent available scores), achievement has increased substantially along with the percentage of students who have satisfactorily mastered a given area. Table Three below summarizes the results.

Test results coupled with a national inservice training program for principals (described below)

also resulted in the resignation or voluntary reassignment to teaching of 2,000 principals. ONPEC officials view this result favorably, as an indication that principals got the message: administration requires leadership, hard work, and attention to academics (Interviews).

Inservice Training for Principals

A companion project to Professor Amornivat's national inservice program for teachers was developed for principals. Under the direction of Professor Teera Runcharoen from Kohn Kaen University, the project, funded by the World Bank, provided in-

Table Three: Student Achievement on the National Sixth Grade Examination 1984-87 by Percent, and Satisfactory Achievement by Percent

Subject Area	Mean Scores				Percent Attaining Satisfactory Achievement			
	1984	1985	1986	1987	1984	1985	1986	1987
Thai	49.08	56.84	58.40	56.29	47	69	76	64
Math	33.11	36.52	47.81	46.16	11	18	41	40
Life Experience	44.01	45.69	54.48	50.79	30	37	65	52
Work-Oriented	55.28	57.60	65.83	62.13	55	60	81	67
Character Development:								
1. Attitude/Feeling	2.88	2.87	2.94	2.91	88	89	92	92
2. Habits	2.14	2.23	2.33	2.30	90	92	96	94
3. Strength	1.65	1.66	2.14	2.06	54	52	86	96
4. Weight	2.42	2.44	2.49	2.08	92	93	94	98
5. Height	2.28	2.27	2.32	2.05	93	93	95	98

Source: ONPEC, 1987, pp. 8-9.

A 1987 evaluation of provinces and districts found that over 60 percent of principals ranked "high" in terms of changed behavior as a result of the inservice training.

service training for all principals in Thailand during a four year period from 1985-1988. Fifteen experienced principals, supervisors from provincial and district offices, and assistants to heads of district offices were recruited for the project. They devoted an entire year to developing, pilot testing, and revising a set of materials that could be used for training and by principals after they returned to their respective schools. Materials included video tapes, slide presentations, and 20 pamphlet-books that described various responsibilities of the principal, provided activities to be carried out during the training, and described a set of projects that could be carried out after the training was over.

The core group, assisted by other ONPEC staff, provided training for all provincial supervisors. Each province then organized the actual inservice programs for principals in their respective provinces at selected district offices. ONPEC staff and several core group members attended each training session to provide an official introduction to the goals, purposes, and expected outcomes, and to serve as facilitators while the provincial supervisors carried out the program.

In contrast to the inservice program for teachers where the atmosphere was relaxed and activities such as composing and singing songs or telling stories followed demonstrations of pedagogical techniques and presentations of academic content, the atmosphere for the principals was deliberately designed to be more pressured and more formal (Interviews). ONPEC officials felt principals needed to recognize that they were accountable for what occurred in their schools. They needed to recognize that this training should be taken seriously and was not just another "one shot" inservice (Interviews).

This atmosphere was created during the first of three phases of the inservice. During this one day orientation, all participants were required to take a pretest on their knowledge of the six areas of administrative responsibilities: academic development, personnel, general clerical and finance, student affairs, building and facilities, and the relationship between the school and the community. (Principals were expected to know these areas since they had received a comprehensive manual from ONPEC in 1983 describing such responsibilities with information on how to carry them out.) In addition to a pretest, overall objectives were explained, directions were given on how to prepare for the training, and questions were answered. In the afternoon, princi-

pals received three of the twenty books and worked on exercises during an intensive study period. They were given five additional books to take home and study and were required to complete a series of exercises before the next phase.

The second phase, which occurred two weeks later, lasted five days. Provincial supervisors summarized the contents of the remaining twelve books using videos and overhead transparencies. Principals worked in groups to complete various activities including simulations to solve typical kinds of administrative problems facing principals.

At the conclusion of the intensive five-day training session, a posttest was administered. Principals who failed to achieve 60 percent had to restudy the material after they returned home and were asked to take the test again a month later. According to those involved, as the training sessions got underway in various provinces, word spread about its rigor and principals from other provinces arrived ready to work. According to participants, this willingness to work stemmed less from the requirement to retake the test than from a desire to avoid embarrassment in the eyes of their teachers if they had to return home having failed the initial posttest (Interviews).

Principals were expected to use the material in the 20 pamphlet-books upon their return home. For a year following the inservice, district and provincial supervisors monitored principal activities in light of the goals of the inservice training. Principals who passed the posttest and received good evaluations during the follow-up year were awarded certificates (ONPEC, 1987). A 1987 evaluation of provinces and districts found that over 60 percent of principals ranked "high" in terms of changed behavior as a result of the inservice training (ONPEC, 1987). As seen above, it was during this period of time that student achievement scores began to increase.

Concurrent with this initiative were a number of changes in the regulations governing the requirements to become a principal. Teachers can no longer simply move into the administrative ranks. Minimum qualifications are required, district and provincial approval is needed, and all candidates must complete a training program in educational administration. Rankings for available positions are determined on the basis of test scores upon completion of the training program and the quality of a "mini-thesis" research project on a theme or issue in educational administration.

...reactions of school clusters to the new regulations may not be uniform. Some may focus more on accountability... while others focus on capacity-building...

Cluster Schools

As far back as 1950, the "cluster school" concept was launched in an experimental project to promote educational improvement in a Thai province. Staff at larger, well-equipped, more effective schools were encouraged to assist teachers at nearby smaller schools to improve their pedagogical skills (Kunarak and Saranyajaya, 1986). During the two decades from 1960-1980, schools throughout Thailand were grouped together in clusters in the hopes that voluntary cooperation, sharing, and participation would occur among schools, not just within each school. The cluster school concept, in short, represented a management strategy for improving teacher productivity.

Various reports (Kunarak and Saranyajaya, 1986; Wongkomolshet, 1983, cited in Kunarak and Saranyajaya; and Sudaprasert, 1983) document the limited scope of school cluster accomplishments to date. Formal cluster committee functions are impressive on paper. They include encouraging school improvement initiatives, staff development activities, and programs between school and community; monitoring teacher performance; evaluating principal performance; passing on annual budget proposals for each school; and recommending promotions for teachers and principals.

In most cases, however, only the promotion recommendations received serious attention until recently. The voluntary nature of cluster activity has meant that individual principals retained final authority over what happened in their schools. Without sufficient authority, cluster activity became largely symbolic, at least in terms of the scale of activity hoped for by the government. Until December 1986, the reform was never effectively implemented, although some individual clusters on their own had pursued one or more functions vigorously.

In late 1986 a major revision in the regulations governing cluster activity affected the authority of cluster committees, chairpersons, and cluster office staff. These changes promise to alter the authority relationships of principals to their individual schools in fundamental ways since cluster responsibilities for school improvement, teacher inservice, and staff evaluation have now been more clearly articulated. In addition, for the first time, a cluster office with full-time staff was created to manage those expanded responsibilities.

While no national studies of cluster influence on classroom learning have been carried out to date, a study under the auspices of BRIDGES examining

cluster activity in two high-achieving clusters in one region in Thailand provides some evidence on the results of this management strategy (Wheeler, et al., 1989). In both clusters testing played a major role in focusing teacher and principal attention on the academic task of schooling. As a result of the sixth grade national test, district and cluster officials developed a wide array of additional tests for students in all grades that are given each term. Six "academic cluster teachers" (the equivalent to master teacher in the U.S.), selected from the various schools in the cluster on the basis of their acknowledged teaching skills, were responsible for designing the tests in cooperation with cluster office staff and district officials. In one cluster all teachers participated in the process of test construction and the results were used in a formative way, suggesting areas of needed improvement. In the other, only the academic cluster teacher and other officials were involved in test construction and the results were published, by school and by teacher, as a way to promote competition among classroom teachers to improve test scores. In some schools the results were also routinely used by principals as a key criterion for recommending merit promotions (i.e., "double" promotions).

In both clusters, staff development as well as material development activities were responsibilities of the academic cluster teachers and the cluster office staff. In one, these activities were carried out to a considerable degree, with positive feedback from classroom teachers and principals regarding their effects on both the content taught and the new types of pedagogical skills learned. In the other, there was little activity as teachers, including academic cluster teachers, retreated to their classrooms to concentrate on raising test scores on the next set of tests.

While it is impossible to generalize about other clusters throughout the country concerning the degree of activity in each area, this study suggests that reactions of school clusters to the new regulations may not be uniform. Some may focus more on accountability through testing and extrinsic rewards such as double promotion, while others focus on capacity-building through staff development and materials development. The degree of actual cluster influence through academic cluster teachers and cluster office staff seems to depend to a considerable degree on the internal dynamics of each school in the cluster, a finding that suggests that, at best, the school cluster concept as an organizational management strategy can only facilitate internal improve-

Instructional quality is still finally determined by what goes on within an individual school, specifically within the classroom and between classroom teachers and administrators and among teachers.

ment in classroom teaching. Instructional quality is still finally determined by what goes on within an individual school, specifically within the classroom and between classroom teachers and administrators and among teachers. National government support from ONPEC for the cluster initiative remains strong, however, as evidenced by a number of in-service training programs designed for academic cluster teachers, school cluster committee members, and local citizens in their responsibilities for improving the effectiveness of school clusters.

Incentive Systems

Watson (1974), in a critical review of the Thai primary education system, notes that one major reason better qualified teachers stay in Bangkok or other large or medium-sized cities and towns is that service in rural areas can jeopardize their promotion prospects. He points out that the government has tried to correct this problem by introducing incentives to persuade teachers to go to rural areas, but does not elaborate on what these incentives were.

Whatever they were, they apparently lacked strong government support, for the literature is filled with examples of how the salary and promotion system until recently served to draw better teachers and principals out of the smaller rural schools to core cluster schools and schools in more urban areas (Chantavanich, 1983; Wuthisen, 1984). Credentials

played a critical role in securing transfers and promotions: the more course credits or the higher the degree, the more likely a transfer or promotion. Credentialism transformed what could have been actual learning into surrogate learning. Once teachers obtained a degree, they requested a transfer. Pending approval, teachers could even arrange leaves of absence from their base school. Either way the result was the same: rural schools with nominally sufficient staff in fact experienced teacher shortages, and morale among those who remained sank even lower.

In the mid-1980s ONPEC revised the regulations governing transfers and promotions. No longer can teachers transfer at will; they must teach at least a year before transferring to another school in the cluster, two years before transferring to another district, and three years before transferring to another province. For both transfers and merit promotions, student academic performance is supposed to be considered along with other factors. In addition ONPEC has tried to make more specific the criteria for "good" teaching, proposing five indicators to principals and district officials for use in evaluating teaching and transfer requests. (Interviews, October 1977). These initiatives are so recent, however, that the conclusion is justified that the current system remains largely intact. Figure Two summarizes the argument for the school management area.

Figure Two: Initiatives to Improve the School Management Process

	Testing	Principal Inservice	School Clusters	Incentive Programs
Implemented at the classroom level	Yes	Yes	In process	In process
Good attainment (i.e., improved student learning)	Yes	Yes	Wait and See	No

Section III: Implementation Characteristics That Help to Predict Success

There are three patterns in the initiatives described. First, several initiatives were not implemented effectively, in the sense that the techniques, materials, or concepts central to the reform were never applied, and the initiatives failed, predictably, to improve school quality. They were either dropped or sharply curtailed (coursework and one shot incentives programs). Although teachers attended these programs, they rarely implemented the techniques presented in their own classrooms.

Second, several initiatives were partially implemented but had little effect on improving school quality. They are now being modified in hopes that more effective implementation and, ultimately, a demonstrable contribution to school quality will follow. These include the 1978 curriculum reform, the cluster school movement, and incentive schemes designed to encourage teachers to stay in rural areas.

The third pattern involves reforms which actually reached the school or classroom levels (i.e. were used by teachers and principals) and which proved effective. These include: RIT, Professor Amornvivat's interactive approach to inservice training for



Strong central support goes beyond rhetoric to the allocation of resources...

teachers, the accountability-focused inservice program for administrators, and the national testing system for sixth grade students. It is perhaps notable that a fourth pattern—involving a vigorously implemented reform that nonetheless proved ineffective—failed to turn up in our sample.

Is it possible to distill from these cases a set of identifiable characteristics of the implementation process that help to predict implementation success?

The criteria are: teachers and principals actually using what was taught or required *and* such actions leading to desired results. We think it is. But such characteristics are related to another dimension which we have yet to introduce, namely the type of policy initiative under consideration. If we look at the array of policies we see that some are designed to make teachers and principals more accountable; that is, to focus their attention on academic tasks as a way to increase student learning. Others are designed to build teacher and principal capacity, in terms of knowledge, to provide quality instruction and administrative leadership as a means to accomplish the same goal. The national testing program illustrates the accountability approach, while interactive staff development programs illustrate the capacity-building approach. Some initiatives, moreover, such as the school cluster reform of 1986, are specifically designed to improve both, but our fieldwork thus far suggests that one or the other approach tends to dominate as time goes on. Thus it is useful first to describe the central characteristics of these two approaches and then return to the elements of "successful implementation," since these elements differ according to the approach used.

Accountability uses regulations, requirements, testing, and hierarchical patterns of decision making and control to improve the quality of education. It assumes that teachers need direction from above, especially poor teachers who might otherwise do little or no teaching. Rewards and incentives are primarily extrinsic, such as salary promotions (double promotions). Public ranking of test results is used as a way to stimulate greater effort by individual teachers.

In contrast, capacity-building emphasizes more collaboration and cooperation to improve the quality of teaching. Under capacity-building, leadership emphasizes participation, in the belief that teachers and principals will collectively develop goals for improving the quality of education in individual classrooms. Teachers are assumed to be competent and sincere in their desire to improve. The most important rewards are often intrinsic, i.e., internal, as the result of participation to define and achieve goals for improvement.

To satisfy our first criterion of "successful implementation" a reform initiative must reach the school or classroom level, i.e., teachers or principals must actually use or carry out what they have learned or been mandated to implement. Strong, united central support is required for initiatives reflecting either approach.

Strong Central Support

In an administrative system as highly centralized as Thailand's, one necessary condition for successful implementation is strong, united central government support, including strong support from within the agency responsible for primary education in Thailand, ONPEC. For example, consider RIT. Although formally a joint project between the Ministry of Education and INNOTECH, Project RIT also received considerable support from the Ministry of Interior during its tryout and experimental years. The MOI, for example, helped RIT staff to recruit teachers and arranged access to districts in two regions for the actual experiment. The Ministry of Education, meanwhile, provided senior staff, office space, and needed equipment (Six Month Progress Report No. 1, 1977). Such cooperation was needed because formal administrative responsibilities for the education system rested with the MOI until 1980. Such cooperation, by itself, also represented a clear indication of serious government support, given the normally separate paths ministries follow as they implement policy in Thailand (a point discussed in greater detail below). Moreover, such support reflected Dr. Rung's view that the project's early accomplishments justified Ministry of Education support. Had he not been convinced of its potential for success, his agency would not have supported its continuation (Interview, October 1987). Once the project came to an end, the Ministry of Education assumed the financial cost of supporting the project and not only increased the scope of RIT activities but its budget as well (between 1980 and 1984, for example, the Ministry spent over \$1.1 million) (Project RIT, 1984).

Interactive models of inservice teacher training provide a second example. ONPEC indicated its strong support for Professor Amornvivat's project to improve teaching efficiency of primary school teachers by its willingness to negotiate a 23 million Baht (1 million dollars) loan from the World Bank and to use portions of its annual budget for the project. ONPEC saw to it that school cluster committees were aware of their responsibility to host the training sessions

and to see that all training materials were available for cluster use at the appropriate times. Regarding the "school-based" model of inservice training, ONPEC launched this initiative with considerable fanfare in 1985 and is now in the process of supporting a number of initiatives using this approach. ONPEC's initiative for principals was also funded by the World Bank, and, as with Professor Amornvivat's project, attendance was mandatory for their target audience.

The national system of testing sixth grade students enjoyed clear support from ONPEC. As described earlier, a wide array of sanctions and rewards were mobilized to capture the attention of provincial education directors who moved quickly to create similar pressure on district officials who in turn responded in similar ways to those organizations down the administrative chain of command. The cluster school concept, as indicated earlier, has long enjoyed central government support but in December 1986, after evaluating the program's strengths and weaknesses, such support was increased through a major revision in the authority of cluster committees, chairpersons, and cluster staff. Several training programs were also launched to help cluster officials, school principals, classroom teachers, and parents understand their new responsibilities.

Strong central support, moreover, goes beyond rhetoric to the allocation of resources, as suggested above and illustrated by a counter example, the 1978 curriculum reform. The commitment of Thai officials at the central level for this reform has been and remains strong, yet its implementation has been largely unsuccessful. A national committee developed the new curriculum over a seven year period; an Education Reform Committee worked to consolidate public opinion behind the reform; teacher training institutions were urged to modify their programs to prepare teachers for the new curriculum; and training courses were conducted on the new curriculum (ONPEC, 1986).

Failure to implement the curriculum occurred because support did not translate into follow-through in terms of resources for training. The 360 million Baht (ca. 15 million dollars) proved woefully inadequate to lead to changes in teacher and principal behavior in schools and classrooms (Interview, June 1988).

The lack of strong united government support, not only between and among ministries but also within ONPEC, can spell the doom of any reform initiative. As noted earlier the Community Based

Active student involvement in experimental RIT classes... mirrored their teachers' active involvement in the implementation of the reform.

Inservice Teacher Program (CBITP) got caught in an administrative province struggle between ONPEC in the Ministry of Education and the Department of Local Administration in the Ministry of Interior. As a result the program saw its funding withdrawn and support given to alternative institutions (the Open University). ONPEC proposals to encourage good teachers and administrators to stay in small rural primary schools have yet to receive a favorable hearing from other more powerful agencies. Only the most dedicated (and skillful) political leadership could possibly lead to agreement among the different agencies responsible for personnel policies in Thailand and the implementation of a new incentive system over the entrenched one. ONPEC leadership for changes in this area, however, has only come recently, too late to have created any meaningful change to date.

Involvement of Those Affected in the Planning and Implementation Phases and the Use of Sanctions and Incentives

The importance of strong, united central support for successful implementation represents only the first step in getting the policy to be used; it is a necessary but not a sufficient condition. The second step depends on the approach that underlies the particular policy initiative: capacity-building or accountability. Capacity-building policies require involvement by those directly affected during the planning and implementation phases if they are to result in changed behavior.

Capacity-Building Policies

The experimental phase of RIT illustrates the theme of involvement. During the first half of 1977 eleven supervisors from the Department of General Education and 41 teachers worked with Project RIT staff to adapt the approach to the Thai context, specifically in the area of curricular design (Project RIT, 1984). During the latter half materials were field tested by RIT staff and collectively revised. Between 1979 and 1981 ten schools took part in the first phase of the experiment. A ten day inservice training program by Project staff prepared teachers in these schools for this new initiative. Each phase was examined: curriculum, group learning, evaluation, and remediation. Between 1982 and 1983 the project was expanded to 700 primary schools in rural areas and 32 secondary schools. Again "on-the-job"

training was used to train teachers to implement the model. The evaluation report (Project RIT, 1984) noted that this kind of inservice "has proved to be very effective as the supervisors (and teachers) have a chance to put theories, which they have learned, into practice. They are able to try out their design and materials in real situations [sic] in schools" (p.31).

As the pilot phase of the project came to a close and the implementation phase began, a change of potentially great significance for the future success of this initiative was introduced. Instead of providing a classroom model that involves teachers directly in trying out materials and receiving feedback on their performance, the project as it is now being institutionalized provides only a training package consisting of a cassette tape, a sample of instructional materials, and a workbook for new teachers (Project RIT, 1984). Teachers are to use this self-instructional package and are to answer questions on an exam that is scored centrally by the Ministry. (Those scoring below 80 percent receive greater supervision than those scoring above 80 percent) (Project RIT, 1984).

The RIT experience illustrates how both the process of implementation and the content of a reform can evolve under the pressure of institutionalization. During the experimental stage, RIT involved teachers in developing materials and in testing them in the classroom. In a very real sense, the teachers helped create the content of the reform during its implementation, and this active learning process motivated them to use the techniques in a sustained way thereafter. Active student involvement in experimental RIT classes, which contradicted the teacher-centered relations of conventional Thai classrooms, mirrored their teachers' active involvement in the implementation of the reform.

Changes in the training process may reduce the chances for comparable levels of success in the schools where RIT has recently been introduced. Interview data from a BRIDGES study of RIT currently in progress shows that provincial administrators responsible for RIT believe this to be the case (Pasigna, forthcoming). Moreover, schools that have used RIT for a number of years are now dependent entirely on the ability of experienced teachers or the principal to train teachers who have recently come to the school. Finally, as noted earlier, RIT is a program designed in part to reduce the number of teachers in a school and is thus best suited for small, rural schools that either have difficulty in recruiting and retaining teachers or do not have the enrollments to

When teachers lack the opportunity to learn the concepts behind the curriculum they are supposed to teach, they don't teach it, or if they do, they teach it poorly.

justify a teacher for every grade. Thus the program is unlikely to expand to more than 20 percent of the primary schools (its current projected expansion). Its materials, however, could be used more widely. Because of their cost this is also unlikely to occur. For example, in grade one, the RIT learning package of 23 books cost 88 Baht (approximately \$3.50), whereas the approved set of six textbooks for the same grade costs only 33 Baht (about \$1.25) (Pasigna, forthcoming).

Turning to a second set of initiatives, interactive models of inservice teacher training, we again see the important role collaboration among these officials played in creating the district results. One of the mottos of Professor Amornvivat's inservice program, for example, takes up this theme explicitly:

It is said that in teaching showing through actual doing only once is worth more than telling how to do it ten times (ONPEC, 1985, p.3).

The format necessitated active involvement by teachers in completely "hands on" activities and exercises to test their understandings of self-instructional packages. The second phase allowed teachers to try out what they had learned, and the third phase, to share their results with peers and project trainers. In so doing teachers took ownership of what they had learned since they could speak from practical experience about the strengths and weaknesses of the curriculum. They also learned from others how to improve activities that had not been successful. Similarly, with the new "school-based" initiatives considerable emphasis is given to meaningful local participation: a core group of teachers from the cluster reviews materials sent from ONPEC, discusses objectives and training strategies in terms of local conditions, and plans how to implement the sessions. For each school building there is a team that implements specific training sessions and encourages teachers to carry out various activities in their classrooms and to communicate their reactions to the committee.

Efforts to implement the 1978 curriculum and to train teachers through "one shot" inservice initiatives or university courses, we have seen, failed in part because those directly affected were not involved in the design and implementation of these efforts. For the 1978 curriculum, what few inservice programs occurred during the first few years used a

teacher-directed lecture format that provided few insights and considerable disengagement.

An interview in Chantavanich's study captured these problems:

Some syllabi such as those for Thai language and arithmetic are very good but I don't understand the other subjects. When we went to the orientation, we were forced to attend only one area of exposure...(p.70).

When teachers lack the opportunity to learn the concepts behind the curriculum they are supposed to teach, they don't teach it, or if they do, they teach it poorly. One inservice session for the 1978 curriculum observed by Chantavanich's research team was devoted to "cooperation." Instead of explaining the concept of teamwork, critical to effective group work, the instructor just lectured on various ways of defining cooperation. Once back in the classroom, teachers who attended that session lacked any real understanding of how to create teamwork, so they just continued using a lecture format.

While available sources do not show whether teachers were involved in the work of the National Committee that developed the new curriculum, we do know that their involvement in the dissemination phase was only passive. They attended what few sessions there were to receive information, not to participate in its design or to receive assistance in how to fit the curriculum to the needs of their respective classrooms. As we have seen, principals received no inservice training at all, which undermined their ability to provide leadership in the school for academic affairs.

For "one shot" inservice sessions, teachers also had virtually no involvement in the design phase of the sessions and little or no participation during the training. Generally they sat and listened to speaker after speaker. As Dr. Rung, then Deputy Secretary-General of ONPEC, put it in a 1985 speech: "Such lectures...were not responsive to teachers...only to the lecturers" (ONPEC, 1985, p.59). Since there was no follow-up to help teachers make sense of what they had learned in terms of their own classroom settings, much of what they learned was never tried but rather soon forgotten (ONPEC, 1985).

University courses proved no better. As Wuthisen shows, CBITP courses were taught using a teacher-centered approach. Students had no input into content and were given only lectures.

The capacity-building policies seem to require (and seem to result in) more active student involvement in the learning process.

Accountability Policies

Turning to the accountability approach we see that participation by those affected is much less important. More important is the ability of the national government, specifically ONPEC, to mobilize and to use a wide array of sanctions and incentives on those who are directly affected. The testing initiative provides a pristine example. The policy was clear, simple, and backed by every available method of coercion and reward available to ONPEC: national meetings with all provincial directors; public rankings; private meetings with senior ONPEC officials; follow-up visits by the Deputy Secretary-General and his staff; reports of success stories; rewards (ranging from double promotions for provinces that improved dramatically to opportunities to attend international conferences for provincial directors who were already at the top of the pay scale); all served to capture the attention of those who were affected. Within a year of the start of this program, a similar system had been instituted within each province affecting districts, school clusters, individual schools, and every classroom teacher. As we have seen, test scores, until 1987, rose dramatically and 2,000 principals are now doing something other than administration.

The inservice program for administrators represents a second example of this accountability approach. All principals had to attend; they faced a difficult pretest over administrative tasks that were already expected to be in place; they had to pass a posttest or face both humiliation at their school and the need to retake the test. They were expected to implement projects from the 20 pamphlet-books they took with them from the sessions; district supervisors were expected to monitor principal performance during the following year. The policy was clear, simple and backed by sanctions; evaluation results show changes occurred in principal behavior.

By way of summary, the successful implementation of policy initiatives requires first of all strong, united government support, particularly by the agency directly administering most primary schools in Thailand, ONPEC; and second, depending on the particular policy approach used (capacity-building or accountability), the involvement of those directly affected or the mobilization of the use of a wide array of sanctions and incentives for those directly affected.

Features of Content that Lead to Desired Change

Once in place, what factors seem to explain why a particular initiative leads to desirable outcomes?

For either approach, it seems to be necessary that the content of the initiative address some of the basic needs of teachers (increased competence in content and pedagogy) and of principals (increased competence in school management practices). After that the conditions again diverge according to type of policy. The capacity-building policies seem to require (and seem to result in) more active student involvement in the learning process. Accountability policies seem to succeed if they respond to deeply held cultural values of deference towards authority and a sense of duty. Let us see how this works in the policies we have described.

Capacity-Building Initiatives

During its experimental years RIT provided a clear illustration of how a reform can address such needs and, in the process, can stimulate greater student engagement in the teaching-learning process. Project RIT materials integrated content across the five subject blocks specified by the 1978 curriculum reform: basic skills, life experiences, character development, work-oriented, and extra experiences. For teachers participating in RIT, inservice sessions provided the first effective introduction to the new curriculum and showed how to make it work in the classroom. Evaluation results, summarized earlier, show that student gains occurred as a result.

RIT also addressed the need for improved pedagogy. The rapid expansion in the number of primary school teachers during the decades 1960-1980 meant that many prospective teachers entered the workforce inadequately prepared in pedagogy. "Chalk and talk" methods of direct instruction (where teachers have no instructional objective and simply write points on the board) predominated in nearly 80 percent of Thai classrooms (Suwanketnikom, 1987) with devastating effects on student interest and engagement. Project RIT directly addressed this problem through its student-centered approach to learning. Student interaction based on group learning activities placed the student in a more active role as a learner. Evaluations documented "more enjoyable learning" from active engagement in learning by doing, through group projects and peer teaching (Project RIT, 1984). As noted above, such engagement led to greater learning gains than instructional strategies where facts were enumerated by an unenthusiastic teacher.

While RIT helped teachers overcome pedagogical deficits and enabled them to implement the 1978 curriculum reform, it also improved their under-

Accountability policies seem to succeed if they respond to deeply held cultural values of deference towards authority and a sense of duty.

standing of content and pedagogy (Project RIT, 1984). In other words, the project also contributed to building content knowledge and pedagogical skills among teachers. It did this in two ways: it provided a systematic approach to instructional design and it encouraged teachers' active involvement in the actual implementation of the system.

Project RIT systematically links instructional content, management, and evaluation. Without RIT, teachers with limited pedagogical and content knowledge are expected to function like professional teachers, i.e., to plan lessons, to prepare instructional materials, and then to teach content. RIT provides the teachers with a set of instructional materials that has been developed by Thai educators and has been thoroughly field tested. As teachers use the materials, they improve their own understanding of the concepts being taught. As they use the management system, which creates a shared responsibility for learning through teacher-student interaction around group learning, teachers experience alternative pedagogical strategies to direct teacher instruction, strategies which then become an integral part of their own teaching repertoires.

Another important contribution of Project RIT is in evaluation. Qualitative case studies (Chantavanich, 1983, and Wuthisen, 1984) document in considerable detail the effects of the inadequate evaluation skills of Thai teachers. RIT directly contributes to improvement in this area since it provides criterion-referenced tests for every unit for all six grades. Not only can teachers monitor student progress, but effective remediation becomes possible.

Quality materials, a management system that engages students in learning, and an evaluation component that identifies what has been learned are useful only to the extent that teachers learn how to use the system. Project RIT has demonstrated that it can do this and has shown, at least in its initial phases, that it is a policy initiative that can improve student learning.

Besides RIT, there is Professor Amornvivat's interactive model of inservice training where all the conditions hold. Her "teaching efficiency" program focuses directly on improving teacher competency to teach the new curriculum while the "school based" inservice initiative includes a major component on promoting cooperative activities in school.

Strong central government support, an implementation process that actively involved teachers, and content that compensated for pedagogical or content deficits or increased competency in these

areas, created an environment for active, even enthusiastic, learning by teachers. This translated into increased student engagement in the learning process and educational gains by primary students. When one or more of the conditions is absent, the reform initiatives are not "successfully implemented."

Accountability Initiatives

As noted earlier, teachers and principals alike in Thailand lack evaluation skills. A national examination for all sixth grade students provides summative information on student competencies. It provides data that identifies candidates for possible rewards such as double promotions, as well as information on areas in need of remediation. Inservice sessions for principals found their way into management practice in part because the material met a definite need. For example, across all the schools in our current field study of two effective school clusters, principals said they benefited enormously from the content of the inservice program. In fact it was not uncommon for them, upon returning home, to promote inservice training for their entire teaching staff, reviewing the major elements of what they had learned so that teachers would be aware of what the principal was doing and why. As with initiatives under the capacity-building approach, one requirement for successful implementation, in terms of creating desired results, is that such policies must meet the needs of those affected. The means used to carry out those policies are of lesser importance.

The second criterion for successful implementation of accountability initiatives differs from that for the capacity-building initiatives. Instead of requiring more student engagement, or altered forms of social relations in the classroom, such reforms must be congruent with a set of cultural values held by teachers and principals alike. In the Thai case this is deference toward higher authorities and a strong sense of duty. Later in this essay we analyze both these themes in greater detail, so at this point all we shall do is to point out that the Thai cultural tradition of deference by subordinates to superiors leads lower level education officials to accept as right and appropriate mandates such as a national test for sixth grade students. Thai teachers and principals saw it as reasonable that the national government should want such information and believed it was their duty to comply. Regarding inservice training for principals, the cultural element is also important for understanding why the policy led to desired results.

The importance of leadership in Thai organiza-

tional life has a special significance. Given a society based on deference from subordinates to superordinates, a clear system of ranking and the notion of "patron-client" relations within organizations (Hanks, 1975), those in authority are expected to lead and, within broad limits of tolerance, similar in many ways to the British Cabinet (Mackintosh, 1962), those who are led expect to follow. Where leadership is absent, organizational life often degenerates into factionalism (Xuto, ed., 1987) as those on similar levels within an organization often find it difficult to cooperate, negotiate, and reach consensus with each other on a common policy. As we have seen, the absence of any inservice training for principals about their responsibilities under the new curriculum had the unintended consequence of undermining their leadership role within the school. As the former Deputy Secretary-General noted in the interview cited earlier, a substantial leadership void existed in most of the primary schools in Thailand during the early to mid-1980s. Inservice training, in fact, was specifically designed to create the capacity for such leadership. While it took an order to get them there (which they accepted as right and appropriate), once there, it did not take principals long to see the implications of the training for increasing their capacity for leadership, which contributed in a fundamental way to spurring their interest and involvement. The news that district and provincial supervisors were to follow up the training session with monitoring visits to see that practice changed, served to reinforce the importance of what principals learned and the role they were expected to play in improving academic learning.

Summary

The importance of this model lies in its explanatory power. It helps to understand why some reforms never got used at all, why some were only partially implemented and thus required revision and further support if they were to work, and why some not only reached the school and classroom levels but actually produced desired effects. Why was the 1978 curriculum not implemented in a systematic way in classrooms? Besides mixed central government support (especially the low level of resources committed to the project), the process of implementation failed to involve teachers and principals in a meaningful way and the information that was provided either came too late (i.e., textbooks) or proved too superficial to use. Why did coursework and "one shot" inservice programs fail? Both might have addressed the content and pedagogical needs of teachers but infighting by agencies at the central level weakened this program and rote lectures killed any interest teachers might have had. The result was a set of initiatives that never found their way into the teaching and administrative practices of schools.

In contrast, interactive models of inservice and Project RIT combined strong, united government support, participation by those directly affected, content that met the needs of teachers and principals, and increased student engagement. As a result what was learned was used and what was used improved student learning. Testing and inservice for principals reached the school and classroom levels and contributed to improved student learning (by focusing attention on the academic task of schooling and increasing the leadership capacity of principals) because of strong government support, content that met the needs of those affected, and the congruence between the ways the reforms were implemented and key values in Thai political culture. See Figure Three, p. 25.

Figure Three: Components of "Successful Implementation"

	Teaching-Learning Process					School Management Process			
	Project RIT	1978 Curriculum	One Shot	Inter-action	Course-work	Testing	Principal Inservice	School Cluster	Incentive Programs
Implemented in the school/classroom	yes	generally not	no	yes	no	yes	yes	in process	in process
1. Strongly united central government support	yes	"yes" (lack of funds)	yes, then no	yes	no	yes	yes	yes	no, recent efforts by ONPEC
2. Involves teachers and administrators in a meaningful way in the design and implementation	yes	no	no	yes	no	-	-	-	-
3. Mobilize and use sanctions and incentives	-	-	-	-	-	yes	yes	in process	yes
Achieved Desired Changes									
1. Content either compensates for pedagogical/content deficits or improves pedagogical/content knowledge	yes	not relevant	not relevant	yes	-	yes	yes	in process	no
2. Greater student/teacher engagement in the learning process	yes	not relevant	not relevant	yes	-	-	-	-	-
3. Reflects cultural values	-	-	-	-	-	yes	yes	-	-

Section IV: Conclusion: Lessons Concerning Obstacles to Initiatives

Monitoring, control, sanctions, and rewards represent one way to improve educational quality. This accountability approach requires little participation in the design of policy by those directly affected; policy simply needs to be carried out. The capacity-building approach rests on collaboration, cooperation, participation, and shared decision making to improve the knowledge of teachers and to create the environment necessary for effective classroom learning. Thai policymakers see these two approaches as part of a comprehensive strategy to improve academic learning. Teachers need to better understand content; they also need to be held accountable for student achievement. Hence staff development and testing are compatible strategies for reaching the same goal (Interview, March 1987). The two strategies, however, also exist in a state of tension with each other and there are signs that the accountability approach now predominates and may have negative consequences for the future development of primary education in Thailand.



...one reading of the reforms is that desired classroom changes must be embodied or expressed in the social relations through which the reform is implemented.

We learned earlier from the former Deputy Secretary-General of ONPEC that a national testing system for sixth grade students was launched as a way to gain some measure of control over a system that was practically devoid of leadership and seemed mired in mediocrity with respect to academic performance. He fully expected that provincial directors would respond by putting pressure on those below them to create a testing system that would lead to improved scores on the sixth grade national exam, and that district officials would follow suit with respect to school clusters (Interview, June 1988). We also learned that principal inservice, programs for provincial and district supervisors, certain changes

in school cluster regulations, and new requirements for transfers all reflect a philosophical belief in ONPEC of the need for improved accountability.

At the same time that initiatives reflecting an accountability approach were being pursued, ONPEC, also aggressively pursued a policy of administratively decentralizing decisions and promoting capacity-building initiatives. The former Deputy Secretary-General explains this second approach in the following way:

...We are so centralized that we cannot solve our problems. The primary school system is a big system. So when I wrote the regulations and developed all these proposals, I made decentralization directly to schools a key part: schools first, then school cluster, provinces and Bangkok (Interview, October 1987).

There is a connection between decentralization of decision making and the style of social relations in classrooms that he hopes the capacity-building policies will create:

It [participation by students in the learning process] means they are planning by themselves. For example, they would like to do something, one exercise about an experiment. It means that they should plan it by themselves. Even education itself, it should be carried out by the student because in our educational system most of the students after graduating from grade six leave the school system. The teacher says do this, do that. When they go out, nobody tells them. They have to know how to do it themselves; there is a big gap between life in the school and life in their home. You have to do it by yourself. We think if they participate, this means everything is by them, not by me. [Why is that good?] Because Thailand is a big system. We cannot decide everything, so they have to decide by themselves and select by themselves. This is what we have to teach them (Interview, October 1987).

Why is this focus important? Effective teaching and learning require engagement, participation and commitment, not passivity or alienation. Participation in implementing a reform is a way to adapt specific components to local needs but it is more than that. It is a way to build knowledge of what participation means. Such knowledge, which teachers gain by participating in the reform itself, may then be transferred to the classroom where teachers elicit active involvement of students in the teaching-learning process. Such a transformation of teacher-student interaction is a key issue that Thai officials involved in these reforms referred to often in our interviews. In a very real sense one reading of the reforms is that desired classroom changes must be embodied or expressed in the social relations through which the reform is implemented. That is, to a certain degree, the medium through which the reform is implemented becomes the message about how classrooms should function.

There is a tension between a capacity-building medium and its message on the one hand and the accountability approach on the other. First, the accountability approach is premised on a hierarchical model of decision making in which decisions come from above with little meaningful participation by those directly affected. The medium and the message of such an approach support teacher authority rather than student participation in learning.

Second, there is the matter of time and rewards. Is a teacher's time better spent teaching his or her own class to the exclusion of everything else so test scores can be raised, with a possible double promotion as a reward, or is it better to spend some time in staff development sessions? Since test results provide immediate feedback compared with staff development (which only improves the capacity of teachers to make a difference over time), making rewards and sanctions highly visible provokes competition for a scarce resource: time.

Third, the accountability approach, as reflected in testing, can rest on a rather narrow definition of education, one that emphasizes factual learning over problem-solving skills. Since the teaching of problem-solving skills lends itself to group work rather than teacher-centered instruction, the need to change the social relations in the classroom becomes especially important, which again serves to put the two approaches in conflict. Given these tensions, what evidence do we have that the accountability approach is now in ascendancy and likely to play an even greater role in the next few years? What might be some of the implications for improving the quality

of primary schools in Thailand?

During the 1980s, ONPEC successfully implemented a number of initiatives reflecting each approach. But in highly centralized systems, leadership becomes especially important. The former Deputy Secretary-General has left ONPEC, taking with him key staff, for the Office of the Private Education Commission, as the result of a promotion to Secretary-General. ONPEC's resources have now been allocated principally toward initiatives reflecting the accountability approach. The testing system is in place at the national, district, and cluster levels with all students being assessed every term by one test or another. Monitoring and supervision by district supervisors, principals, and certain school cluster officials are now stressed. Meanwhile Professor Amornvivat's inservice program is over.

But there is more to resolving the current problem than simply shifting priorities under a new leadership team. Capacity-building policies face an especially difficult challenge in becoming an established part of the policy agenda in Thailand. Thailand is a highly centralized administrative system with a political culture that supports decisions from above and limited participation. Let us examine both these points.

Thai Bureaucracy

One way to view Thai government administration is in terms of the bamboo plant. Bamboo shoots are strong. They bend with the wind but do not break. Hollow, they may grow to a considerable height, perhaps by the hundreds in a single grove. But there is no interpenetration between one shoot and the rest.

This is akin to Thai government agencies: ministries, departments, and so on. Each one parallels the rest as it reaches out from Bangkok to the country's 72 provinces and 500 districts. Funds and decisions flow downward in a single agency, and there is no real interpenetration, no effective inter-agency activity. There is, of course, a clamor for coordination, especially to meet new crises. The unilateral attempts at coordination that are made, however, are equivalent to the "click, click, click" sound made by bamboo blowing gently in the breeze. One bamboo shoot cannot hear the others, at however many points they may touch (Morell and Samudavanya, 1981, p. 70).

The roots of this system, as Riggs (1966) has shown, go back to the bureaucratic reorganization of 1892 which increased the centralization of the regime by creating new, national, functionally specialized administrative departments, each with its headquarters in Bangkok and linked with corresponding field offices at the regional, provincial, and district levels of government. The events of 1932 further strengthened the bureaucracy as political power shifted from the throne to a bureaucratic ruling circle. Since then, reforms designed to increase legislative and elected official control over the bureaucracy have had little success.

In such a "bureaucratic polity" decisions come down from above with little opportunity for meaningful input by those ultimately affected: the teachers and principals.

Political Culture

Centralized decision making rests not only on the power of those at the top but also on the cultural attitudes of those at the bottom. There is a basis in Thai culture for legitimizing the authority of those who rule simply because they actually hold power. Phillips and Wilson (1964) found that Thai peasants "look to their government as a source of gentle benevolent concern," as a body possessed, ideally, of "the attributes of a strong, wise, but indulgent father" (pp. 15-16).

These generalized virtues manifest themselves in the social behavior of the Thai by their adherence to the belief that the proper manner of ordering specific social relations is by expression of respect. Symbols and gestures of respect from lower to higher status are the very stuff of the actual relationship between persons. Even in the language...differences of status and the respectful aspect of these differences are an integral part of the vocabulary (Wilson, p.79).

Riggs (1966) argues that this attitude is rooted in a metaphysical view of the nature of reality based on the idea of karma and the inherent justice of underlying reality, manifested through chains of reincarnation and the cause-effect sequences which occur throughout life. Thus, according to Wilson, "one's place is a result of one's own will," and "one is therefore ultimately responsible for one's own posi-

tion in society," (1966, p.7). Wilson goes on to argue:

The position of a being, human or otherwise, in the universe may be measured by the degree to which he is subject to the will and power of others. This conception is the one which must be referred to throughout the discussion of Thai politics, i.e., the necessary and just unity of virtue and power. Those who have power are good and deserve their good fortune. Power justifies itself (p.7).

Such norms make it possible for teachers, principals, district officials, and provincial administrators to accept, even rationalize, deference to central policymakers.

With this background we now see that once priorities shift, once strong, united support from ON-PEC is reduced, the likelihood of the balance tilting strongly toward accountability initiatives is increased significantly because this approach is so congruent with the larger administrative system and the cultural values of Thai citizens.

But we have seen capacity-building policies are also effective tools for improving primary school quality. In addition to improving student learning, they promote certain important attributes within schools which can lead to sustained change and school improvement: a school-wide climate focusing on academics, especially for low-achieving students; teacher collegiality to share and increase knowledge of pedagogy and content; principal leadership and participatory decision making; the development and use of materials across classrooms; and a commitment by school staff to develop meaningful links to its community (see Schwille, et al., 1986 for a discussion of these attributes in Third World countries and Wheeler, et al., 1989 for Thailand).

Just as massive changes in primary education during the period 1960-1980 created a new set of problems, the initiatives pursued during the 1980s have generated their own dilemmas. The lessons of "successfully implemented" initiatives suggest that a balance between accountability and capacity-building policies is important because it can lead to improvement in student learning and create the conditions for self-sustaining change within schools. Whether that balance can be maintained, or even recreated, and whether the tensions between the two approaches can be resolved represent the challenges of the 1990s.

Bibliography

- Amornvivat, S., et al. (1986). "Final Report of Project: The Improvement of Teaching Efficiency of the Primary School Teachers." Ministry of Education, Thailand.
- Bhumirat, C. (1984). "The Case of Thailand" in *The Drop-out Problem in Primary Education: Some Case Studies*. The UNESCO Research Office for Education in Asia, VI (2), 189-200.
- Bhumirat, C.; Kidchanapanish, S.; Arunrungrueng, P.; and Shinatrakool, R. (with assistance of Sirigirakal, V.) (1987). "Research and Evaluation on the Quality of Primary Education in Thailand." Office of the National Education Commission, Bangkok, Thailand.
- Chantavanich, S. (1983). "The Quality of Rural Primary Schooling in Thailand." Office of the National Education Commission and the National Institute of Development Administration, Bangkok, Thailand. (unpublished).
- Chuaratanaphong, J.; Bhumirat, G.; Wheeler, C.; Sookpokakit, B.; Lamsukawat, S.; Peisnsa-ard, S.; Shinatrakool, R.; and Sirigirakal, V. (with assistance of Kunarak, P.) (June 1989) "Improving Primary School Quality in Thailand: An Exploratory Study of an Effective School Cluster." Michigan State University, East Lansing, Michigan and the Office of the National Education Commission, Bangkok, Thailand.
- Cohen, D.K., and Neufeld, B. (1981). "The Failure of High Schools and the Progress of Education." *Daedalus*, 110.
- Hanks, L. (1975). "The Thai Social Order as Entourage and Circle" in Skinner, G. and Kirsch, A., eds. *Change and Persistence in Thai Society*. Ithaca: Cornell University Press.
- INNOTECH. (1978). Project RIT for Mass Primary Education: A Progress Report, (2). Quezon City, Philippines: Southeast Asian Ministers of Education Organization's Center for Innovation and Technology.
- Krannich, R.L. and Krannich, C.R. (1980). *The Politics of Family Planning Policy: Thailand - A Case of Successful Implementation*. Berkeley, CA: Center for South and Southeast Asia Studies.
- Kunarak, P. and Saranyajaya, A. (1986). "Project RECOMB: Remodeling the School Cluster's Organization and Management Boundary: A Synopsis Report." Research report submitted to UNICEF National Primary Education Commission, Thailand.
- Kunarak, P. (with assistance of Sookpokakit, B.) (1987). "Increasing Primary School Teachers' Productivity: A Review of Policy Implications on Educational Quality in Thailand." Office of the National Education Commission, Bangkok, Thailand.
- Mackintosh, J. (1962). *The British Cabinet*. London: University of Toronto Press.
- Morell, D., and Samudavanya, C. (1981). *Political Conflict in Thailand: Reform - Reaction - Revolution*. Cambridge, MA: Oelgeschlager, Gunn and Main, Publishers Inc.
- Nichols, S. (1982). "Low-Cost Learning Systems: The General Concept and Some Specific Examples." *NSPI Journal*, September, 4-8.
- Office of the National Primary Education Commission (1985). "The Development of School-Based In-service Training in Thailand." Ministry of Education, Thailand.
- Office of the National Primary Education Commission (1987). "The Use of Manuals for the Follow-Up and Supervision of School Administrators."
- Evaluation report submitted to the Office of the National Primary Education Commission, Bangkok, Thailand. (In Thai).

Office of the National Primary Education Commission (1987). *National Evaluation Results for Sixth Grade Students*. Ministry of Education, Bangkok, Thailand.

ONPEC. Ministry of Education (1986). *Assessment of the Quality of Education of the Schools in the "Small Elementary School Development Project" Using RIT Learning Packages* (English translation of title of the Thai report). Bangkok, Thailand: Author.

Pasigna, A. (forthcoming). "Reduced Instructional Time (RIT): A Study of a Low-Cost Learning System in Thailand." Institute of International Research, Bloomington, Indiana.

Phillips, H.A. and William, D.A. (1964). "Certain Effects of Culture and Social Organization on Internal Security in Thailand." Santa Monica, CA: The Rand Corporation, Memorandum Rm. 3786-ARPA (abridged).

Pitayanuwat, S.; Rutponlamueng, C.; Pratoomrat, S.; Boomyawiro, W.; Jitumpai, S.; Sumranjai, J.; and Duntawanit, P. (1986). "Evaluation Report of the Project to Improve the Efficiency of Primary School Teaching." Office of the National Primary Education Commission, Bangkok, Thailand. (In Thai).

Project RIT (1984). *Project RIT (Reduced Instructional Time)*. Lopburi, Thailand: Author.

"Project RIT (Reduced Instructional Time): Muang Mai School, Lopburi, Thailand" (1984). Bangkok, Thailand.

Schwille, J.; Beeftu, A.; Navarro, R.; Prouty, R.; Raudenbush, S.; Schmidt, W.; Tsang, M.; and Wheeler, C. (1986). "Recognizing, Fostering and

Modeling the Effectiveness of Schools as Organizations in Third World Countries." Literature review for Harvard University for Project BRIDGES. East Lansing, Michigan.

Sudaprasert, K. (1983). "The School Cluster System in Thailand: An Evaluation of Selected Aspects of an Educational Innovation." Unpublished doctoral dissertation, Florida State University, Florida.

Suwanketnikom, S. (1987). "Inservice Initiatives in Thailand." Bangkok, Thailand.

Valenti, J.J. (1979). "Current Problems and Developments in Thai Education." *International Review of Education*, 20 (1), 71-81.

Watson, J.K.P. (1974). "Primary Education in Thailand: Plans, Problems and Possibilities." *Comparative Education*, 10 (1), 35-37.

Wongkomoshet, A. (1983). "Opinions and Expectations of Elementary School Cluster Commissions and Teachers Concerning Roles of Elementary School Cluster Commissions in Educational Region Eight." Unpublished master's thesis, Chulalongkorn University. Bangkok, Thailand. (In Thai).

Wuthisen, S. (1984). "The Teacher Training Regional Network for Educational Innovation: A Qualitative Study of an Inservice Teacher Training Program in Northwestern Thailand" Unpublished dissertation, Florida State University.

Xuto, S., ed. (1987). *Government and Politics of Thailand*. Oxford: Oxford University Press.

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**Decentralization in Education:
An Economic Perspective**

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Summary

Educational decentralization policies have been adopted or are under consideration in a number of the developing countries. Educational development projects inevitably have some impact on the degree of centralization in education. These facts provide the rationale for a critical assessment of decentralization and an evaluation of developing countries' experience. This paper defines educational decentralization, presents economic criteria for evaluating decentralization policy, assesses the results of decentralization policies, discusses factors which influence successful implementation of decentralization, and makes recommendations for further research to guide Bank lending policy.

For the purposes of this paper, decentralization policies will be categorized as those which: (i) delegate decisionmaking to autonomous, public entities, (ii) deconcentrate decisionmaking to subnational directorates of the central government, and (iii) devolve decisionmaking to local governments or community organizations. Devolution receives the most critical attention in this paper.

The degree of centralization in educational systems typically varies with the decisionmaking areas, including school organization, curriculum and teaching methods, examinations and supervision, teacher recruitment and compensation, finance of recurrent expenditures, and school construction and finance. The desirability and feasibility of decentralization in these

areas depends on the structure of government finance, political environment, government and administrative structure, and the historical and cultural context. Given these conditions, economic criteria can be used to evaluate decentralization plans.

Three economic criteria are used to evaluate decentralization -- social efficiency, technical efficiency, and equity. These criteria argue for some decisionmaking areas (finance, teacher recruitment) provided at the local level, with other areas (school organization, curriculum) supplied at the regional level, and a system of central government grants to correct some of the efficiency and equity problems inherent in a decentralized system.

Little is known about the economic and educational consequences of decentralization, in spite of a wide variety of country experiences. The effects of decentralization are difficult to isolate, and scholars have instead focused on implementation issues. Decentralization policies are most successfully implemented if there is a tradition of self-reliance by local communities; if local governments or communities have their own sources of tax revenues and voluntary contributions; if the pressure for decentralization originates with the community rather than ministry planners; if all important affected political groups, especially teachers, are involved and informed about development of decentralization plans; and if administrative capacity at the local level either already exists or is trained.

I. Introduction

In recent years there has been renewed interest by countries, international aid organizations, and scholars in decentralization of government, including public education. Countries on every continent have either considered or attempted to implement some form of educational decentralization. In 1972, Peru established regionalized directorates and community nuclei to reduce bureaucracy and incorporate disadvantaged groups in society. In 1974, the Philippines established thirteen regional offices of the Ministry of Education to undertake regional planning and administration. In 1977, Nigeria modified its constitution to establish local governments, whose main function is provision of primary education. And, in 1980, Chile instituted the most radical decentralization policy to date, assigning the responsibility for elementary and secondary education to municipalities, along with local revenue sources to support them.

International aid organizations have, by and large, been supportive of such decentralization policies. The United States Agency for International Development (USAID) has generally favored strong community involvement in educational planning (see Korten and Alonso, 1981), and a recent director of the Agency strongly supported decentralization efforts. UNESCO has generally favored decentralization as one means of incorporating marginal groups in public decisionmaking and improving the quality of services they receive (see the 1982 UN Report). The World Bank has no official position on educational decentralization but has generally been sympathetic to decentralization efforts (see the 1983 *World Bank Development Report*).

Finally, scholars have repeatedly studied the decentralization phenomenon, recently with an emphasis on both political motivation for and the implementation of decentralization efforts. The scholarly interest of the 1980s is in contrast to scholarly articles of the 1950s, which expressed most interest in decentralization and establishment and strengthening of local governments as a means towards democratization (see Conyers, 1984). Scholarly interest parallels government interest in decentralization in those two time periods. During the 1960s and 1970s scholars and countries were more interested in central government planning, including educational planning, and implications of such planning for centralized control of resources. The implications of planning for centralization were complemented by African independence and resulting efforts to eliminate colonial influences

through the nationalization of schools. Ironically, colonial administrative structures were used to implement such centralization policies.

Rationale for Decentralization

Countries may adopt decentralization policies for a variety of reasons, some explicitly expressed in policy statements, some of which are only implicitly revealed through administrative actions. The rationale for educational decentralization can be grouped into three broad categories: (i) educational finance, (ii) efficiency and effectiveness, and (iii) redistribution of political power.

Financial arguments for educational decentralization are a recent phenomenon. The proportion of school-age children enrolled in primary and secondary schools has grown rapidly over the past two decades, and educational expenditures have grown rapidly as well. Central governments now find themselves facing severe fiscal constraints to continued expansion of educational opportunities. Hence, shifting part of the burden for support of primary and secondary education to subnational units of government, to community and voluntary organizations, and to parents has become an increasingly attractive alternative. The form of shifting advocated in decentralization plans varies with a variety of country characteristics, including the form of government, colonial administrative heritage, and traditions of community involvement.

Efficiency arguments for decentralization typically focus on the high unit costs of primary and secondary education provided by the central government. One explanation for such high costs is inadequate national government capacity to administer a centralized educational system. Another explanation is the costs of decisionmaking in a system where even the most minor local education matters must be decided by a geographically and culturally distant bureaucracy in the capital city. Yet another explanation is the frequent application by education ministries of national standards for curriculum, construction, teacher quality, etc., thereby preventing cost savings through adjustments of educational inputs to local or regional price differences.

The effectiveness rationale for decentralization argues that the centralized planning policies popular in the 1960s have resulted in expensive education, which is decreasing in quality. After independence, many countries (e.g., Guyana) nationalized and cen-

tralized their educational systems and established free education as a right. Given current fiscal constraints, such a policy can continue to be followed only with decreasing educational quality. Administration and accountability can be improved in education, it is argued, by making schools more responsive to parents and local communities and eliminating the need for central government decisions on local educational matters. These arguments are buttressed by evidence of greater cost-effectiveness in the private sector. In Senegal, for example, unit costs are higher and exam pass-rates are lower in public than private, religious schools.

An example of these arguments for decentralization is given in the sixth five-year plan of Pakistan:

The nearly comprehensive nationalization of educational institutions and the accompanying policy of free education ten years ago had at least two casualties. An already impoverished Government was landed with a large financial burden which restricted it from expanding education. And many of the schools of high quality, some of them run by education-conscious communities, lost their excellence under the public control. This, in both quantity and quality, was counter-productive. (Government of Pakistan, *The Sixth Five-Year Plan, 1983-1988*, Planning Commission, Islamabad, pp. 318-319, as quoted in Jimenez and Tan (1987).)

Redistribution of political power is rarely stated as an objective of decentralization, but democratization or inclusion of marginal groups in society is a frequently stated goal. An example is the 1972 Peruvian educational reform which explicitly attempted to include Indians and other disadvantaged groups in education decisionmaking. McGinn and Street (1986) argue that redistribution of political power is the primary objective of decentralization. With that as the objective, decentralization may be undertaken to empower those groups in society which support central government policies or to weaken groups posing obstructions to those policies. Thus, decentralization in Mexico has served to reduce the power of the teachers union by transferring salary negotiations from the central to the state government level. From this perspective, decentralization is less concerned with the transfer of power from one level of government to another than it is with the transfer of power

from one group to another. And, ironically, one consequence of decentralization may be to increase the effective control of the central government, or at least that of key decisionmakers within the central government.

Questions to be Answered

This paper does not deal further with the issue of why countries choose to decentralize. Rather, the focus here is on whether decentralization is wise educational policy. Examination of this issue requires that a number of specific questions be answered. Among the questions requiring answers are:

- E What is meant by the term decentralization? What, specifically, does it mean in the context of public education?
- E What kinds of decentralization are in fact undertaken by developing countries?
- E What is the desirable level of centralization or decentralization from an analytic perspective? How is the answer to this question affected by the economic, political, and administrative institutions of most developing countries?

Typically, there is divergence between stated goals and actual outcomes of government policies. What are the political, economic, and educational consequences of decentralization?

Decentralization itself leads to problems. What is the proper role of the central government in correcting those problems in a decentralized educational system? Which factors appear to most strongly influence successful implementation of decentralization policies in terms of stated goals?

Finally, after reviewing the literature on educational decentralization, what is the status of our knowledge? And what should the priorities be for further research and study on the subject?

The term decentralization has several definitions, as shown below, but most commonly it refers to the devolution of some degree of decisionmaking power to the local government or community organizations. Unless stated otherwise, this is the definition used in this paper.

II. Definition of Decentralization

Centralization-decentralization can be viewed as a spectrum ranging from a unitary governmental system where the central government has most power or decisionmaking authority to a governmental system where local governments and community organizations exercise large amounts of power. The ultimate centralized system is one in which all decisions are made in the nation's capital, and the ultimate decentralized system is one where all decisions are made by individuals, community organizations, and small local governments.

Definitions

Since most countries are relatively centralized in terms of public decisionmaking, most policy discussion concerns alternative means of decentralizing, not centralizing. Four types of decentralization are typically identified in the literature (Rondinelli, 1984): deconcentration, delegation, devolution, and privatization. If successfully implemented, each of these types of decentralization results in a unique system for financing and for delivering education. In what follows, I will attempt to define these terms and give examples of educational systems corresponding to each type.

Centralized Decisionmaking

In a centralized governmental structure, education is financed and managed from the center. The nature of education is such that some decisionmaking power must be given to school teachers and administrators, but typically they can make only the most routine decisions and have no or little control over resource allocation in the schools. An example of a centralized country is Cameroon, where almost all educational revenues are derived from central government revenues (excepting some fees in former Anglophone provinces), and the central government determines curricula, sets and evaluates exams, and recruits, assigns and promotes teachers and administrators. There are administrative representatives of the Ministry of Education outside the capital city, but their fiscal and decisionmaking independence is very small.

Delegated Decisionmaking

Delegation is the transfer of government tasks or functions to autonomous organizations such as public corporations and many regional development agen-

cies, which may then receive public funding and are ultimately accountable to the government. The most commonly delegated areas in the education sector are vocational and higher education. Autonomous training agencies, such as SENA in Colombia and SENAI in Brazil, have been established in a number of developing countries. These agencies typically are assigned a general task (e.g., vocational training), given an independent source of revenue (often an earmarked payroll tax), and report to a board of directors rather than any particular minister. Similarly, universities are often autonomous bodies which receive direct funding from the government but are subject to little direct control.

Examples of delegation in elementary-secondary education are not readily found. In Lesotho most elementary education is delegated to the churches, with teacher salaries paid by the government; this pattern was not uncommon elsewhere in Africa prior to independence. In other countries, it is not uncommon for the government to pay all or some portion of teacher salaries in religious schools, even when public schools exist as well. Examples are Papua New Guinea, where teacher salaries in religious schools are paid by the government, and Paraguay, where some teachers in religious schools receive pay from the government (Winkler, 1980).

Deconcentrated Decisionmaking

Deconcentration refers to the transfer of authority to lower levels within central government agencies. Often this takes the form of creating or expanding powers of regional directorates. This has been an especially common form of decentralization in Latin America. Among the countries which have established regional directorates of the education ministry are Peru, Colombia, Chile, and the Philippines. These directorates vary in power, but they often have the responsibility of supervision and planning for the region.

Devolved Decisionmaking

Devolution implies the creation of autonomous and independent subnational units of government, which have authority to raise revenues and spend. Devolution may result in a strong central authority and community-financed and managed schools. It may, also, result in a federal form of government in which general purpose regional or local governments have re-

sponsibility for the finance and provision of elementary and secondary education. The similarity between devolution and federalism is demonstrated by a popular economic definition of federalism:

A public sector with both centralized and decentralized decisionmaking in which choices made at each level concerning the provision of public services are determined largely by the demands for these services by the residents of (and perhaps others who carry on activities in) the respective jurisdiction. (Oates, 1972)

There are a number of examples of federalism among developing countries including Brazil, India, Malaysia, Nigeria, Pakistan, and Papua New Guinea. In each of these countries decisionmaking authority is divided between the central government and regional governments. Local governments, also, typically exist in some form, but in most countries their power and authority is determined by the regional government; furthermore, regional government is often highly centralized, even in a decentralized, federal system.

Elementary and secondary education may be devolved to regional governments, local governments, or both. In India, education was devolved to the state governments in the constitution of 1950, although the central government still plays an important role in determining the size of revenue transfers to the states for education. Primary and secondary education have also been devolved to the provincial level in Papua New Guinea. On the other hand, primary education is devolved to local government in Brazil and Nigeria, while secondary education is largely the responsibility of the regional or state governments. In Brazil, the organization of primary education varies by state, but in most states there exist parallel local and state primary school systems with local schools funded largely from local government revenue sources and state schools funded by state revenue sources; both school systems also receive some transfers from the central government. In Nigeria, the local government is responsible for managing primary schools and providing revenues for school construction and materials and supplies, but most operating revenue comes from state government transfers, and state revenues in turn are largely derived from the central government.

The Eclectic Model

Some countries do not fit well any of the descriptions given above. In particular, some countries have centralized and nationalized systems of primary education but decentralized systems of secondary education, in large part because the central government

does not have sufficient revenues to fully fund secondary education. Both Kenya and Indonesia, for example, have free, nationalized primary education and more decentralized provision of secondary education. For example, in Kenya the central government has established conditions to foster development of community-based ("harambee") and financed secondary schools, but such schools will probably be nationalized or managed and financed by the central government as the central government budget permits.

An important feature of the eclectic model is the parallel existence of several types of schools. For example, in Kenyan secondary education, one finds central government schools (23 percent of the total), community "harambee" schools (50 percent), and subsidized community or private schools (21 percent) (Ayot and Lillis, 1985). Another feature of this eclectic model is government subvention, usually in the form of teachers salaries, of education provided by private, usually religious, schools. In some cases, subventions may cover almost the entire cost of teacher compensation, yet management lies with the private school. For example, in Indonesian secondary education one finds a combination of government schools (56 percent of the total) and private schools (44 percent), with the private schools receiving significant government subventions (20 percent of total compensation costs) in the form of payment of teacher salaries. In addition, even students in Indonesian government schools pay sizeable enrollment fees, constituting as much as ten percent of recurrent expenditures (Meesook, nd).

Another version of the eclectic model is, in principle, the educational system which has centralized decisionmaking but which has many of the characteristics of decentralized systems: salary scales which vary by location, local provision of some educational services through contracts with the central government, and substantial community input to local school finance without commensurate local control. In practice, systems with centralized decisionmaking rarely permit these characteristics to exist.

Measures of Decentralization

A measure of decentralization would ideally measure control or decisionmaking authority. One plausible measure of control over resource allocation is the percent of expenditures born directly by users and local (or regional) government. Three problems exist with this measure. The first and most serious is that central government regulations and mandates on subnational units of government may result in those units having very little control over resource allocation

or spending in spite of seemingly high direct financial contributions to education. For example, if the central ministry of education mandates class size and teacher salary, which represents a high proportion of recurrent expenditures, the subnational government may have control over very few resources.

A second problem has to do with the treatment of central government transfers to subnational governments. Subnational units of government may receive transfers in the form of block grants, categorical education grants, and earmarked tax revenues. If such transfers are relatively stable over time, they may be *de facto* own-source revenues of the lower unit of government; this is especially true if the transfers are fungible such that the lower unit of government can in fact use a special grant for general purposes. But if the magnitude of, say, earmarked revenues varies with political and educational conditions, such revenues may be *de facto* central government revenues, in spite of the fact that government accounts show them being directly distributed to the lower units of government.

A third difficulty is that the degree of fiscal decentralization is determined not only by the proportion of funding directly provided by lower units of government but, also, by the number of lower units of government. Other things equal, the larger the number of units of government, the more control local citizens have over resource allocation decisions in their local schools.

An alternative measure of decentralization would more directly reflect the distribution of decisionmaking authority. This measure would reveal the degree of central government control over major kinds of educational decisions: curriculum, construction and construction standards, teacher assignment and pay, etc. Decisionmaking with respect to the various educational functions is discussed in more detail later.

Regional versus Local Autonomy

Educational decisions can be made at several levels -- national, regional, local, the school or school district, and the family. Decentralization refers to the decisionmaking authority of subnational units of government, but quite clearly decisionmaking by regional governments in India is quite different from decisionmaking by the community in the "harambee" schools of Kenya. Furthermore, there may be conflict between decentralization at the regional and the local levels. In Chile, for example, municipalization of education came at the expense of the regional directorates, which were established earlier (Magendzo and Egana, 1985). In India, the 1950 constitution assigned elementary and secondary education as a re-

sponsibility of the state governments, and the local government contribution to education has consequently declined over time (Tilak, 1984).

The rationale for decentralization may differ markedly depending on the level to which educational decisionmaking responsibilities are assigned. Decentralization to the regional level is most frequently undertaken for reasons of administrative convenience (as in Latin America) or to appease subnational cultures (e.g., India and Papua New Guinea). Decentralization to the local level is more commonly undertaken as a means of democratization and increasing citizen participation, especially of ethnic or disadvantaged minorities, and as a means of stimulating larger financial contributions by the community.

In most developing countries, local governments have relatively little independence. Even among federal countries, constitutions rarely specify the powers of local governments (Brazil and Nigeria are exceptions); most constitutions spell out only relations between the regional and central governments and leave the assignment of local government powers, to the regional government. In fact, it's not clear that local governments have any more power in federal than unitary systems. Local governments are frequently dependent on regional governments for some services, the pass-through of some central government grants, approval of tax increases, and appointment of chief government officers.

Primary and secondary education may be the responsibility of the central, regional, or local governments in a federal system. And, when the responsibility is assigned to local authorities, those authorities may be elected by local citizens (as in Brazil and Sri Lanka), appointed by regional authorities (as in Malaysia and Korea), or some mix of the two (e.g., India where local councils are elected but the chief administrative officer is appointed by the state). Furthermore, education may be assigned to a general purpose government (such as a municipality) or to a special purpose government or special district; the latter is uncommon among developing countries, although community schools financed by some combination of contributions and compulsory fees resemble the special district. Special districts are, however, used in the provision of some urban services and could conceivably also be used in education.

Decentralization of Education Functions

In discussing centralization-decentralization in education, it is useful to disaggregate the provision of educational services into its various components or functions. For the purposes of this analysis, these

components are labeled: school organization; curriculum and teaching methods; examinations and supervision; teacher recruitment and compensation; finance of recurrent expenditures; and school construction and finance. The degree of centralization of decision-making differs by component. For example, curriculum decisions may be highly centralized at the same time that school construction and finance is very decentralized. It is the mix of decisionmaking powers with respect to the various components which leads to a summary description of an entire educational system as being centralized or decentralized. Table 1 suggests the mixes most commonly found in educational systems described as centralized, decentralized, and mixed.

For any given country, the degree of centralization with respect to each component can be determined through the examination of educational plans and operational guidelines of the ministry of education. But there is often a discrepancy between what is written or reported and what is practiced. In particular, the central government often sets guidelines for curriculum, teacher qualifications, school construction standards, etc., which are unrealistically high given the income and human resources of the country. The result may be that what appears to be strict central government regulations and mandates are not enforced and are in fact largely ignored by the providers of educational services.

School Organization

School organization refers to the establishment of minimum schooling requirements, the structure of elementary-secondary schooling, and the rights of children to education. Excepting a very few federalist systems (e.g., the United States), decisions about school organization are highly centralized. However, in spite of a high degree of centralization, large differences in compliance with organizational standards, especially in providing educational opportunities to all children, are found in all school systems. (e.g., inequalities in service provision between regions, income groups, and urban/rural areas are found in all countries; see Carron and Chau).

The major difference between decentralized and centralized school systems lies with which level of government makes the resource allocation decisions resulting in unequal opportunities. In the centralized model unequal educational opportunities are the result of resource allocation decisions made in the ministry of education itself. In the decentralized model, unequal educational opportunities are usually the result of differences in wealth or tax base between the

local or regional governments responsible for financing elementary-secondary education; this is the case, for example, in Brazil. In the mixed model where the community often supplements central or regionally provided education with its own contributions, unequal opportunities are the result of both factors -- variations in tax base or income among communities and central government decisions to distribute resources unequally; this is the case, for example, in the secondary schools of Kenya.

Curriculum and Teaching Methods

As with school organization, curriculum standards are usually regulated and teacher education usually provided by the central government; in most countries, public school curriculum standards are, also, extended to private schools (e.g., Indonesia). Curriculum is typically viewed as being the domain of experts, who mainly reside in teacher colleges or the ministry of education. Teacher education is, also, typically viewed as the responsibility of the central government, or the regional government in large decentralized systems. In-service training, however, is usually somewhat more decentralized, with either a regional government or the regional directorate of the central ministry playing an important role in organization and delivery.

Centralization of curriculum decisionmaking need not imply a uniform curriculum. In Cameroon, the curriculum follows the French model and is highly specific and identical in all parts of the country. But other centralized countries have attempted to differentiate the curriculum to meet the instructional needs of different social groups. A tightly controlled pedagogy can be one policy response to the problem of poorly qualified teachers.

Centralization of curriculum decisionmaking also need not imply centralized production and distribution of textbooks. The ministry of education (or, in some federal systems, the regional secretariat of education) can produce and distribute textbooks to schools or school children. Or it can purchase and distribute textbooks. Or it can simply require students to purchase their own textbooks from either the ministry or local bookstores. In addition, the ministry can either specify the precise textbooks to accompany the curriculum, or it can give schools the freedom to select from an approved textbook list.

Examinations and Supervision

Perhaps the most crucial question regarding educational supervision is who selects the chief administra-

Table 1

Centralization-Decentralization Typology for Public Education

	<i>School Organization</i>	<i>Curriculum and Teaching Methods</i>	<i>Examinations and Supervision</i>
Centralized Model	Minimum schooling requirements and school organization (preschool, primary, secondary, vocational, higher education) set by the central government.	Curriculum, teaching materials, pre-service and in-service instruction provided by the central ministry of education.	Examinations set and evaluated, as well as teaching performance evaluated by central ministry of education; responsibility for direct supervision often lies with regional administrative offices.
Mixed Model	The central government determines organization of the schooling system, but the local community helps determine how many years of education are provided, often through at least temporary self-finance of years beyond those funded or authorized by the central government.	Curriculum, teaching materials, and in-service instruction established and provided by the central government or through its regional delegations.	Examinations are set centrally but usually administered and evaluated regionally; the instruction, often through regional or district offices.
Decentralized Model	Organization of schooling is almost always set by the central ministry of education; the local community decides how many years and levels of education will be provided.	The basic contents of the curriculum are set centrally, but textbooks may be selected and purchased locally, and in-service instruction may be provided locally or regionally depending on the size of the locale.	No national examination system exists; all examinations are set and evaluated locally; the central or regional governments usually provide limited supervision of teachers and schools.

tive officer of a school or group of schools and what power that individual has over the various educational functions. The chief administrator is typically appointed by the ministry (or the regional education secretariat) in a highly centralized system and may have relatively few powers other than sending personnel evaluations to the ministry and monitoring the education and examination system to assure compliance with ministry guidelines. On the other hand, in a decentralized system the chief administrator may be directly elected by the local community or may be

appointed by an elected mayor or council. Between these two extremes is the administrator who is appointed by the ministry and given considerable decisionmaking authority over resource allocation within the schools. In many countries, transportation is sufficiently difficult and human resources sufficiently scarce that, irrespective of how the administrator is selected, there is very little actual supervision of the schools. The fact that in many countries administrators are also responsible for supervising private schools only exacerbates this resource problem.

*Teacher Recruitment
and Compensation*

Central government sets accreditation standards, provides teacher education, sets teacher pay scales, and directly pays the teachers; in some cases (Francophone Africa) teacher recruitment, pay, and promotion may be under control of the civil service ministry rather than the ministry of education.

Teachers may be selected by the local school authority, but the central or regional government typically prescribes pay scales; accreditation standards are also set centrally.

Teachers are selected and pay scales are set by local government; accreditation standards are typically set by the central government but they may not be enforced.

*Finance of Recurrent
Expenditures*

All recurrent expenditures fully funded by central government excepting minor user fees; nonteacher resources distributed to schools.

The central or regional government provide most funding of local schools in the form of block grants or project grants, but some portion of educational expenditures are funded by local revenue sources, and the local community has some influence on total expenditure levels.

Local government funds elementary and sometimes secondary education from local revenue sources; user fees or "voluntary" contributions to the parents-teachers associations may be required; block grants or project grants may be provided by the central government.

*School Construction
and Finance*

Central government sets construction standards, which may be uniform for the entire country, and covers all construction costs, although the local community may be required to provide labor and/or some construction materials.

Construction standards are set by the central or regional government and matching funds are often provided for school construction; in some cases the matching funds take the form of a promise by the central government to cover some portions of recurrent expenditures, often teacher salaries.

Land and materials for school construction are provided by the local community; labor may be voluntary; local construction standards used.

Examinations provide a standard for measuring and evaluating learning. Variation in examination control and procedures is perhaps more extreme than any other educational function. In many former British colonies (e.g., countries in the West Indies) exams are set and graded in England. At the other extreme are most countries in Latin America which have no standardized national or other examinations; as a result, the criteria set for passing from one grade or one level to the next are set at the school level and vary greatly. In between these two extremes are countries which set

and grade exams nationally or regionally. Although a system of national examinations is typically found in the centralized model, Latin America demonstrates that local control of examinations and promotion standards can coexist in relatively centralized systems.

Teacher Recruitment and Compensation

Accreditation standards for teachers are almost always set centrally (a notable exception is the United States where state governments license teachers), but

the criteria set for accreditation are often ideal standards which cannot be met in practice. The local or regional labor market for teachers determines *de facto* local or regional accreditation standards, even in highly centralized school systems.

Teacher recruitment and promotion practices vary greatly between countries. In a highly centralized country like Cameroon the ministry of education doesn't even control recruitment and promotion. Instead the ministry of public service recruits, appoints, promotes, and moves teachers; nationally recruited teachers are also likely to enjoy civil service protection. In a decentralized country like Brazil, the community may itself recruit teachers, and employment and promotion may be in part politically determined (patronage of the elected mayor). Teacher compensation practices are highly correlated with recruitment procedures. When recruitment and promotion are centralized, there typically is a national pay scale, which does not vary with working conditions. When recruitment is decentralized, teachers are usually paid in accordance with local labor market conditions. One may also find (e.g., in Latin America) national pay scales and local recruitment of teachers. Furthermore, even in centralized systems with national pay scales, one may find local communities recruiting and setting teacher pay for additional grades beyond those provided by the central government.

Finance of Recurrent Expenditures

In a highly centralized educational system, the government both finances and directly provides all inputs with no local contribution (excepting minor matriculation fees). In a decentralized system, the local community finances and directly provides inputs, either through local tax revenues (e.g., Brazil) or through "voluntary" fees (e.g., Kenya). A mixed system would include central government finance and provision of some educational inputs (e.g., books, supervision) and grants (block and/or project) to regional or local government and some local community control over use of those funds (e.g., Colombia, India, Nigeria). An example of the latter is the Indian midday meal program which is provided by the local community but partly financed by central government grants. In general, the finance of government services is more decentralized in developing than industrialized countries. In an unpublished monograph, Bahl and Linnes find 15 percent of total government expenditures are financed at the local level in developing societies, compared with 32 percent in industrialized countries. In

addition, they found the relative importance of local government finance is larger in federalist countries and in large countries.

In addition to directly financing education, the central government also often exerts other kinds of financial control. Frequently, it performs an auditing function to assure voluntary or local contributions are used in accordance with regulations. This auditing and financial control often extends to private and community-based schools, where central governments often regulate user fees or development fees (e.g., Kenya).

School Construction and Finance

In the centralized model, the central government sets uniform construction standards and directly carries out all school construction. In the decentralized model, the local community finances (often through voluntary contributions) and constructs schools using local materials and construction standards. In the mixed model, the central government may construct schools using different regional standards, or the community constructing its own school may be required to follow government standards for the school to be accredited and staffed.

In practice, school construction and finance tends to be more decentralized than the other components of elementary-secondary education, especially in Africa and Asia. In many countries the central government offers an implicit matching grant, promising to staff the school constructed by the local community (e.g., Eastern Nigeria, Kenya, Zimbabwe, India).

Conclusions

In assessing whether an educational system is centralized or decentralized, it is necessary to look at the distribution of decisionmaking authority with respect to various educational functions. In doing so, one finds some educational functions (e.g., curriculum) tend to be controlled centrally, even in systems which in other respects appear decentralized. And, some educational functions (e.g., construction) tend to be provided locally, even in systems which in other respects appear centralized.

It is the combination of decisionmaking authority with respect to the various functions which determines whether the system can be characterized as centralized or decentralized. But the answers to three questions best discriminate between centralized and decentralized systems. Those questions are:

E Who selects the chief administrative officers of local schools, and what control do they have over resource allocation?

E Which level of government is responsible for recruiting and promoting teachers? Is there a national pay scale?

E What proportion of total expenditures is financed through local revenue sources, both tax revenues and voluntary contributions?

III. The Principles of Decentralization

The desirable level of centralization in education is that which maximizes social welfare. However, since there are no direct measures of social welfare, the question of the desired level of centralization must be answered using a variety of proxy criteria. The principle criteria employed here are: social efficiency, technical efficiency, and equity. But application of these criteria is a mere academic exercise unless the political and institutional contexts are considered as well. In what follows, the political and institutional constraints to either centralization or decentralization are first discussed. The initial conditions of the political and institutional contexts and their relationship to decentralization are summarized in Table 2.

As noted earlier, decentralization is an ambiguous term which includes a variety of governmental ar-

rangements for the finance and provision of public services. As typically used in elementary-secondary education, however, decentralization refers to devolution of decisionmaking authority to a subnational level, regional or local, of government. The most important constraints to devolution occur at the local level. As a result, it is devolution to the community or local government which is the focus of the analysis below.

Constraints on the Locus of Decisionmaking

Public Finance

Decentralization implies that the community or local government has decisionmaking authority with

Table 2

Initial Conditions for Decentralization

Initial Conditions Arrayed on Scale of Largest to Smallest Difficulty in Implementing Decentralization

<i>Government Finance</i>	<i>Political Context</i>	<i>Administrative Structure</i>	<i>Historical Context</i>
Direct central government provision of educational inputs to local schools.	Decentralization policy introduced by the central government, no consultation with affected groups, and associated with a particular politician or political party.	Constitution assigns responsibility for education to central government; lack of administrative capacity at local level.	Tradition of dependence by local communities on the central government.
Conditional cash grants for specific projects or functions.	Decentralization advocated by the central government with consultation with affected groups and with broad political support.	Central government administrative tasks already deconcentrated to the regional or local level.	Tradition of self-reliance by local communities and spirit of competition between communities.
Unconditional educational block grants or earmarked shares of central government tax revenues.	Pressure for decentralization originates at the local level and with affected groups, including parents, teachers, and local government officials.	Some educational decisionmaking given to local authorities, and local authorities permitted to raise some educational revenues.	
Large, local-government own-source revenues from taxes and voluntary cash and in-kind contributions.		Local authorities given significant decisionmaking responsibilities, resulting in development of local administrative capacity.	

respect to both the level and distribution of educational resources. These resources may be financed by transfers from the central government, own-source tax revenues, user fees, and voluntary association fees.

As noted earlier, the most common form of transfers from the central (or regional) government is payment of teacher salaries. In addition, central governments frequently provide grants to local or regional government for specific educational plans or projects. Both of these transfers are accompanied by regulations and restrictions that greatly limit the resource allocation authority of the local schools. Of course, to the extent such transfers are fungible, meaning the local government would have purchased the same inputs in the absence of the grants, they in fact provide a new source of unencumbered funds (albeit with administrative costs associated with preparing projects, disbursing funds, and monitoring and auditing use of funds).

Central government transfers to local governments can be constructed to give local governments substantial resource allocation authority while still fulfilling objectives of the central ministry of education. But in reality the grantor (the ministry) typically mistrusts the use of funds by local education authorities and, thus, attaches a number of conditions (such as projects) to the use of funds. The result can be, and frequently is, centralized resource allocation in a seemingly decentralized educational system.

Communities or local governments, of course, can often raise their own revenues, which can be allocated in accordance with local priorities. But the possibilities of raising substantial local revenues are often limited and sometimes prohibited by the country's constitution. The most common local government tax is the property tax which suffers from two major defects: (i) low revenue elasticity, which makes it a poor tax in a changing environment, and (ii) requirements for sophisticated tax administration, including cadastral surveys, objective assessments, and a professional, skilled administrative corps. The requirements for good property tax administration are typically unmet in developing countries.

Another means of providing own-source tax revenues is through a national tax on personal income, sales, employees, or some other measure of business activity, with some portion of the proceeds earmarked for automatic return to state or local governments. In Brazil, for example, a portion of a two percent payroll tax is automatically returned to state governments in proportion to revenues raised within the jurisdiction. Such automatic transfers of earmarked revenues avoid the administrative requirements of the property tax, and the tax itself may be more revenue elastic. On the

other hand, centrally administered taxes tend to have uniform tax rates, thereby limiting the revenue-raising authority of local jurisdictions. While it would be possible to devise centrally-administered taxes with variable rates, this is rarely if ever done.

Finally, communities can raise revenues for education through user fees, donated labor and materials, and voluntary or involuntary association fees. Quite clearly, some countries (e.g., Kenya, Indonesia) raise substantial revenues through these sources. But a variety of problems limit the use of user fees and voluntary association fees in most countries.

Often there are both legal and political constraints on user fees. The level of user fees imposed by the community or the local parent-teacher association (PTA) is usually limited and regulated by the central government due to the conflict such fees present with notions of "free education and equal access". Simply the reporting requirements for such fees may either limit their use or provide an incentive for local jurisdictions to not report their use (e.g., see Paul's discussion of Guyana). In other cases, schools are not permitted to keep the full revenues from the fees, thereby limiting incentives to impose fees. For example, in Indonesia schools can set fees, but all revenues accrue to the central government, which then redistributes the proceeds (Meesoek).

If truly voluntary, association fees such as those for the PTA suffer from the usual free rider problem. In some African countries (e.g., Kenya, Anglophone Cameroon) such fees raise significant amounts of revenue only because they are in effect involuntary. On the other hand, contributions can come from a wide variety of sources and organizations, including parents, alumni, and local businesses. The variety of possible voluntary fees and other contributions are discussed elsewhere (Bray, 1985).

In addition to fees, communities can provide labor and materials for school construction, maintenance, etc. These in-kind contributions appear to be most successful when there is a definite target (e.g., constructing a school or competing with a neighboring community) but are less useful as a means of financing recurrent expenditures. A problem with relying on in-kind contributions of labor is that the opportunity cost of labor rises as per capita income increases. Thus, such contributions are less likely to be successful in urban areas than rural areas and are less likely to generate significant revenues in middle-income than low-income countries.

In sum, there are serious constraints on the ability of local governments or communities to raise revenues to support local schools. In some countries these constraints may pose an effective deterrent to the in-

roduction of decentralization measures which require local governments to raise revenues. However, for most countries, aside from legal constraints, local governments could, with technical assistance in tax administration, community organizing, etc., raise some revenues for local education.

Political Context

Both the political context and the administrative structure of a country may also pose constraints to decentralization. The political ideology and policy positions of key actors and interest groups in education play an important role in both the adoption and implementation of decentralization measures. As discussed later, lack of political support, not a shortage of technical expertise, most frequently is the cause of failed decentralization plans. The key political actors on the decentralization stage include functionaries in the ministry of education, teacher organizations, local government officials, local school administrators, parents, and parent-teacher associations.

Decentralization entails the redistribution of political power between different groups in society. While it may increase the power of local government at the expense of the central government, decentralization frequently strengthens the power of the central government (Conyers, 1984). In Chile, devolution of primary and secondary education to the municipalities occurred simultaneously with closer central government control over the municipalities with mayors appointed by the president and previously-elected community advisors being appointed by the mayor. In Mexico, delegation of teacher negotiation authority to representatives of the ministry of education in the thirty-one states appears to have had the underlying political goal of weakening the bargaining power of the union (McGinn and Street, 1986).

To be successful, decentralization plans must yield enough influential winners to more than offset the losers, and the plan must be constructed so as to prevent any one group of losers from blocking the entire plan. Since many interest groups tend to be risk averse, the mere uncertainty associated with the outcomes of decentralization is an important deterrent to change. The political constraint may not necessarily argue against attempting any form of decentralization, but it does prescribe care in attending to political concerns in assembling a decentralization plan. While the literature on implementation suggests some of the political problems which may arise, there is no positive theory of implementation to guide policymakers.

Government and Administrative Structure

Both the structure of government and administrative capacity can also serve as constraints to decentralization. Structure of government refers to constitutional and other legal constraints, including the existence of sub-national units of government, and whether chief administrative officers are appointed or elected, while administrative capacity refers to the ability to make and implement decisions; to collect revenues, budget, and keep government accounts; and to monitor and audit expenditures.

In most countries, the constitution determines the institutions of government, including the existence and powers of sub-national units of government. The constitution, or other legislation, assigns taxing and spending powers as well as governmental functions, including education, to different levels of government. If the constitution assigns most power to raise revenue and most education decisionmaking authority to the central government, decentralization may be difficult to legislate. The magnitude of the change required suggests new legislation may be forthcoming only in the case of national emergency or revolution (e.g., Chile).

The colonial administrative heritage of a country influences the writing of the constitution, citizen expectations, and administrative practice. Spanish colonial rule, for example, was hierarchical and centralized, characterized by paternalistic legislation regulating minutiae in the colonies. Regulations established ideal rules of conduct, even if those ideals were unrealistic. Little or no attention was paid to local conditions and regional differences in drafting and promulgating regulations.

The same pattern persists in most former Spanish colonies today, well over a century after independence. According to Hanson (1974), there tends to be hierarchical leadership in the ministry of education, and political allegiance is the principal criterion for appointment to important educational positions. The result is that educational decisions are largely made on the basis of political not educational grounds. The ministry still issues a comprehensive set of rules formulated for ideal conditions not found in the real world, with the requirement that children and schools conform to ideals, not generally allowing variation depending on local conditions. The result is a high degree of centralization, local officials visiting the central ministry to obtain favors much as in colonial times, and a local citizenry with no developed sense of autonomy and local control. Decentralization, which

requires a sense of local autonomy and control and reduced power at the ministry level, is difficult to implement given this administrative history.

One finds much the same administrative heritage in former French colonies. The French administrative system had very weak subnational units of government and highly centralized control. This heritage makes it difficult for ministries to give up control, and local communities tend to lack the requisite skills for managing themselves (Nellis has described how the intent to decentralize in Tunisia was frustrated by these factors).

The British colonies were, also, highly centralized as a means of exerting colonial control. But the British also introduced a tradition of fee-based and community-supported education, which was sometimes affiliated with religious missions. Included in this tradition was the important role of support groups like the PTA and Old Students or Old Boys alumni organizations. These support groups have tended to persist, even after the nationalization of schools by newly independent countries and even in socialist countries (e.g., Zagefka discusses their role in Burma). The tradition of user fees, voluntary associations, and local control facilitates the successful implementation of decentralization policies.

Administrative capacity at each level of government -- central, regional, local -- can also serve as an important constraint on decentralization. The capacities of local governments to tax, spend, and keep government accounts were discussed earlier with respect to public finance. Capacity at the local level is, also, required to administer a personnel system with some degree of civil service protection. In addition, in a system in which the central government transfers resources to lower levels of government, the central government requires the capacity to audit the use of funds and to prosecute corrupt practices, and auditing cannot occur in the absence of standardized accounting practices by the governments receiving the funds.

The administrative capacity of governments is also influenced by the education and training of decision-makers as well as the individuals who elect or appoint those decisionmakers. If local citizens are largely illiterate, they may not be able to make informed, rational choices in electing local leaders who advocate particular education policies. If local government administrators are poorly educated and have weak administrative skills, they may make poor educational policy decisions and lack the ability to carry them out or to appoint qualified administrators to do so.

In brief, the institutional structure and history of

government and the administrative capacity at various levels of government can act as serious constraints to decentralization. Effective decentralization may require constitutional change, changes in values, and training to improve administrative skills in some countries.

Historical and Cultural Context

The historical and cultural context also strongly influences the ability to decentralize. Some countries (e.g., Kenya, Nigeria) have a tradition of local community participation that extends beyond the colonial experience and facilitates attempts to decentralize education. Other countries have regarded decentralized education (especially the mission schools) as a colonial institution and have centralized and nationalized education upon independence. In still other countries, religion introduces values which either facilitate or deter decentralization. Islam, for example, values the diffusion of authority, which in countries like Pakistan is conducive to attempts to decentralize.

Social Efficiency

There are a number of administrative, political, historical, and cultural variables which influence how educational services are financed and delivered. These variables cannot be ignored in attempting to answer the rather academic question, what is the desired degree of centralization in education. But understanding that these variables can act as constraints on decentralization, one can still ask, if these conditions permit choice as to the organization of government, what is the desirable level of centralization. Are there economic grounds for advocating decentralization policies? Three economic criteria are used to answer this question: social efficiency, technical efficiency, and equity. The definition of these criteria and their implications for decentralization in education are summarized in Table 3.

Social efficiency refers to the use of society's resources to maximize social welfare. As used here, it is especially concerned with the match between the preferences of citizens regarding education and the educational services they receive.

Public Choice

The match between consumer-citizen preferences and public service provision is often studied under the rubric "public choice," which is the application of

market principles to the provision of government services. This match is presumed to be closer or better if the consumer-citizen in fact has choices. That is, if the consumer-citizen has the ability to elect local education leaders, decide how much to pay in taxes in order to receive a desired level of educational services, and has the freedom to move to another jurisdiction ("vote with the feet") offering a preferred combination of tax and service levels, social welfare is presumed to be higher. Public choice becomes private choice when citizens choose to send children to private-schools, in which case they can directly select that school which offers the desired combination of user fees and educational services. Public choice is the economic argument for citizen participation in educational decisionmaking. In its pure form, this participation takes the form of citizens directly selecting educational leaders, educational taxes or fees, and educational service levels.

The consumer-citizen may be frustrated in effectively expressing preferences by a number of factors. First, citizens may be unable to either directly (voting) or indirectly (voting for a local, general government head who appoints the school chief) elect the local school administrator. Second, citizens may be constrained in their ability to raise local tax revenues, to set user fees or to impose involuntary association dues for the purposes of raising education revenues. If in a decentralized system citizens are unable to express preferences or intensity of preferences with respect to educational leadership, revenues and expenditures, the match between citizen tastes and educational services provided may not be any closer than that in some centralized systems.

A third factor limiting the expression of preferences is the inability of citizens to move from one jurisdiction to another to find the desired combination of taxes and educational services. If jurisdictions are large, citizens are less likely to be able to make such moves than if jurisdictions are small. And if local jurisdictions are not allowed by the central or regional government to vary their tax rates and/or educational expenditures, "voting with the feet" is of little consequence.

A fourth factor which limits the expression of preferences is central government regulation. To the extent the central government attaches conditions to grants to the local government and to the extent it mandates the level and use of educational resources, the local consumer-citizen may be dissatisfied in the resulting quality and quantity of educational services.

Of course, local public choice needs to be tempered by other considerations, in particular externalities and economies of scale with respect to some educational

functions. It may not be appropriate for local voters, especially if poorly educated, to select the curriculum and set accreditation standards, but it is appropriate for them to exercise some choice over how their personal income is allocated between government and private goods and choice over how the government budget is divided between education and other services.

Externalities

Externalities refer to the division between who pays for services and who receives the benefits. Elementary-secondary education exhibits significant externalities in the form of benefits to society from having a literate, skilled, well-socialized population. One can conceive of a local community which all the children leave, perhaps due to lack of employment opportunities, when fully grown and educated. The parents of children in the community will receive private benefits as a result of their children being educated and the economic returns which accrue to that education. But others in the community may perceive themselves as receiving very few private benefits. On the other hand, all members of society, especially in the communities to which the children move, receive societal benefits resulting from the education of the children. In other words, other members of society receive benefits without having had to pay for them, i.e., an externality.

In a decentralized system, interjurisdictional spillovers of benefits such as those described above constitute externalities which tend to reduce the amount of educational services provided by the local community. If taxing and educational spending decisions are made by the local voters, they will ignore the externality and thus spend too little on education. Two solutions to the problem are possible. One is to nationalize education, such that all the externalities are internalized in making decisions about educational spending; this, of course, is not consistent with decentralization. Another solution is for the central government to provide matching grants to local jurisdictions to encourage them to increase their spending on elementary-secondary education to assure generation of the desirable level of social benefits. Of course, social benefits are not easily measured, and the desirable level of social benefits is not easily determined. How society values these external benefits can only be revealed through the process used to select national (or regional) leaders and the budgetary priorities they assign to education.

In addition to interjurisdictional spillovers, there are other external benefits associated with particular

Table 3

Economic Criteria for the Evaluation of Decentralization

<u>Criteria</u>	<u>Definition</u>	<u>Implications for Centralization/ Decentralization in Education</u>
<i>Social Efficiency</i>		
Public Choice	The match between consumer-citizen preferences and public service provision.	Local citizens should have an important voice in choosing the combination of taxes/fees and educational services in the community and should also, have some influence on the nature of educational services provided. Central government regulations, restrictions, and mandates may limit public choice, as may the local tax base and impediments to the citizen "voting with his feet".
Externalities	The discrepancy between who pays for services and who receives the benefits.	Interjurisdictional spillovers may result in insufficient educational spending in a decentralized system. The central government may need to institute a system of matching grants to assure a socially desired level of spending.
External Efficiency	The balance between labor skills provided by the educational system and labor market demand.	In a country with distinct urban/rural and regional labor markets there should be variation within the country in terms of school organization, curriculum and the quantity of schooling.
<i>Technical Efficiency</i>		
Internal Efficiency	Maximization of educational output for a given educational cost.	Internal efficiency is higher when prices of educational inputs are allowed to vary with local (urban/rural, regional) market conditions, and the educational input mix is adjusted for local prices. Economies of scale may argue for centralization of some educational functions. Administrative costs, including both administrative capacity and the time required to make decisions, also affect unit costs and, thus, internal efficiency.
Technological Change	An increase in the educational output possible from a given level of inputs.	Technological change and innovation in educational organization and service delivery is likely to be greater in a system which both permits and encourages educational diversity and competition.
<i>Equity</i>		
Horizontal Equity	Individuals in like circumstances are treated equally.	When some portion of school revenues are generated from local tax sources, variations in wealth of the local tax base may lead to horizontal inequity. The central government can reduce the size of the problem through grants in aid to local schools with the size of the per pupil grant varying inversely with the local tax base per capita.
Vertical Equity	Relative equality of educational opportunity.	Equality of educational opportunity may be measured by access to and quality of education. In centralized systems, inequality is the result of central government decisions regarding resource allocation; in decentralized systems inequality may result from variations in local tax base and citizen willingness to pay for education. In either case the central government may use grants-in-aid to reduce spending disparities and improve equality of opportunity.

educational functions which may argue for either centralized or decentralized decisionmaking. Standardized examinations and similar school organization and curriculum standards across communities or regions may, for example, facilitate inter-regional migration of human capital both for the purposes of employment and further schooling. The result may be better informed and more efficient labor markets.

External Efficiency

External efficiency is the match of labor skills with labor market demand. Most countries or even regions are large enough to encompass rural areas where agricultural activities predominate, urban areas with heavy concentrations of retail and office activities, and industrial areas occupied by manufacturing firms. Somewhat different labor skills are demanded in each of these geographic areas, which may argue for different education to better prepare students in the needed skills and to maximize the social returns to public investment in human capital. Different education may entail variation in school organization, curriculum, and the quantity of schooling provided.

External efficiency argues for variation with respect to school organization, curriculum and the quantity of schooling. Such variation could be provided through the centralized ministry of education, or it could come about as a result of decentralized decisionmaking. Experience suggests that centralization tends to lead to uniformity in school organization and curriculum but not uniformity with respect to quantity of schooling. Decentralized decisionmaking may be required to yield the desired variation consistent with external efficiency.

Technical Efficiency

In addition to social efficiency, the degree of centralization may affect technical efficiency. Technical efficiency is primarily concerned with efficient resource allocation within the educational system, or minimizing unit costs.

Internal Efficiency

The degree of centralization affects several aspects of resource allocation, or internal efficiency. First, internal efficiency requires adjusting input combinations consistent with prices in the locality of the school. Under centralization, this is unlikely to occur unless local representatives of the ministry are empowered to determine what prices they are willing to pay for services, materials and supplies. But in most

centralized systems, there are uniform, national pay scales for teachers, and many school inputs (e.g., textbooks, furniture, food for school meals) are purchased centrally and distributed to local schools.

Second, internal efficiency is affected by administrative costs and efficiency, including administrative overhead, management capability, and time required for decisionmaking. The argument is sometimes made that decentralized administration leads to the duplication of administrative functions in each of the local (or regional) jurisdictions and, thus, leads to increased administrative costs.

The argument of duplicated costs essentially concerns economies of scale. Some administrative functions -- teacher supervision, budget preparation, local planning -- are of necessity carried out in small scale at the local level, irrespective of the degree of centralization with respect to other educational functions. But other administrative or educational functions may exhibit sizeable economies of scale. These functions include: curriculum development, development of instructional materials, and setting and grading standardized examinations. Thus, there may be a cost argument for centralization of some educational functions.

The scarcity of management skills in developing countries can also argue for centralized administration, wherein a few, skilled and educated administrators make decisions for the entire school system. But, as noted above, it's difficult to avoid locating some administrative functions at the local level, even in a centralized school system; some decisionmaking requires knowledge of the local situation that a physically removed administrator cannot know well. Still, the lack of management skills argues for somewhat greater centralization in, say, setting examinations and supervising local schools. There is little evidence in general, that decentralization has served to improve public management (Rondinelli, Nellis and Cheena). Nor is there evidence to show that decentralization has increased local participation, at least in Latin America.

Centralization of decisionmaking has one unambiguous cost -- the time required for decisions to be made. Often even the most minor expenditure of funds or personnel action requires filling a form, sending it to the ministry (perhaps via an intermediary regional ministry representative), awaiting a response, perhaps sending another appeal prior to receiving the response, and perhaps receiving a response requesting more information or better justification for the request. Bureaucrats in the central ministry have incentives to be cautious in their actions but no incentives to quickly respond to requests from the field. In the

meantime, the lack of affirmative response, to even obvious requests, may have serious negative consequences for education. One possible response to this situation is to improve response time in the ministry, but the bureaucratic incentives are such that response time will always be slower than that found in a decentralized system.

Technical efficiency is also affected by the use of community resources. The community devotes resources, in both pecuniary and non-pecuniary forms, directly to the production of educational services and, also, to lobbying for additional education resources from funding sources. The argument is frequently made that if the local community is given more responsibility for funding education and selecting local education leaders, it is likely to increase direct participation in the schools. If this increased productive participation is accompanied by decreased (socially) nonproductive participation in lobbying for funds, the net result is an increase in educational services with no increase in cost. But if the increased participation comes at the expense of citizen time spent in other endeavors, including leisure, there is an opportunity cost to the increase in educational services.

There is little evidence on either the social or technical efficiency consequences of decentralization. There are no studies to determine the extent to which decentralization in fact alters the nature of education services offered and the degree to which beneficiaries of those services are more or less satisfied. With respect to technical efficiency, construction costs of locally-constructed schools tend to be lower than ministry-built schools due to the use of lower cost materials and lower costs associated with contract administration. On the other hand, there has been concern in Nigeria that the growth in the number of local governments, which are responsible for elementary education, may be increasing the costs of administrative overhead.

There is some evidence that locally-provided schooling may be of lower quality. The "harambee" schools of Kenya, for example, are of low quality, both in terms of inputs (teacher quality) and outputs; only 13 percent of "harambee" schools exceed minimum standards (grade 4 attainment levels) compared to 79 percent of central government schools. But evidence from Brazil is mixed, at least with respect to quality of inputs; expenditures per pupil are lower in municipal than state schools in the Northeast, but the opposite is true in some states in the South. In neither case (Brazil and Kenya) can low quality of education be attributed to decentralization; rather, the cause of low quality education appears to be the fact that locally-provided schooling appears to be most common in

rural and poor areas where the central and regional governments have failed to provide educational opportunities equal to those in urban and richer areas.

Technological Change

A nationalized educational system is a monopoly which, excepting a few private schools which usually serve either the very rich or the very poor, permits little or no competition. As noted earlier, even the competition from the private sector is often heavily regulated, including tuition charges. The results of monopoly in other industries are well known -- little incentive to innovate, excessively high costs, and insufficient production. A plausible hypothesis is that some of these same results are found in highly centralized educational systems. Another plausible hypothesis is that, other things held equal, decentralization may lead to greater competition between local school systems and, consequently, greater innovation and technological change, reflected in lower unit costs.

Equity

The principal objections to decentralization concern the consequences for both horizontal and vertical equity. A related equity concern, especially among school teachers, is unequal pay for equal work; decentralization to the local level implies variation in teacher pay scales, reflecting local labor market conditions. The only effective solution to this pay equity concern is a national pay scale, which in turn implies a high degree of centralization.

Horizontal Equity

The principle of horizontal equity refers to individuals in like circumstances being treated equally. Education which is locally financed may violate this principle; individuals of given income and wealth levels are treated differently depending on the tax base of the community in which they live. A community with a high tax base per school child needs to set a lower tax rate to yield a given amount of revenue per child than does a community with a lower tax base. If the tax base is property wealth, two individuals with the same wealth pay different tax bills depending on whether they live in the low or high tax base community.

Horizontal inequity can have negative effects on economic efficiency (Buchanan). All individuals have an incentive to live in the high tax base, low tax rate jurisdiction, but it is only those of high income who can respond to the incentive. The result is communi-

ties which tend to be segregated on the basis of income; either the rich or the poor live in a given community. If the high income individuals also have skills (e.g., medical) demanded by all members of society, the result of geographic segregation may be an oversupply of such skills to the wealthy community and an undersupply to the poor community.

Grants-in-aid can be used to solve or at least ameliorate the horizontal equity problem. The central government can distribute block grants, the per capita size of which is inversely related to the local tax base, and thereby effectively reduce any tax advantage to living in a wealthier community. Alternatively, the central government could specifically reduce the horizontal inequity for education by distributing grants to local schools, the per students size of which is inversely related to the local tax base per pupil. The foundation plan used in many states of the United States sets a minimum (foundation) desired level of educational spending and then eliminates any tax base advantage for spending up to that foundation level. Beyond the foundation level, communities may decide to tax and spend whatever they wish. Of course, if the foundation level is not set high enough, there are still powerful incentives to individuals to locate in communities with a high tax base.

Vertical Equity

Vertical equity in education refers to the relationship between educational expenditures and family, community, or regional income or wealth. Ignoring how education is financed, maximum vertical equity would entail all children receiving the same value of educational resources, measured either on a per year basis or on a lifetime basis. Measured on the basis of annual expenditures, large inequalities in educational spending currently exist in developing countries between urban and rural areas, between geographic regions, and between income groups, irrespective of the degree of centralization in decisionmaking. Measured on the basis of lifetime educational expenditures, these inequalities are much larger still.

A decentralized educational system in which communities (or regions) both raise revenues and make educational expenditures is likely to yield significant inequalities in educational spending if only due to differences in tax base and income between communities.

The empirical evidence on the effects of decentralization, however, are ambiguous. In Chile, for example, municipalization was accompanied by altering central grants from a system that redistributed in favor of poorer regions to one which redistributes on a

per capita basis, thereby increasing inequities between rich and poor regions. And in Eastern Nigeria, wealthier communities were found to respond most strongly to government incentives for the construction of new schools. On the other hand, Knight and Sabot (1986) compared Kenya, which permitted a large expansion of secondary education via community supported harambee schools, and Tanzania, which did not permit such expansion by local communities and exercised strict quality controls. They concluded the Kenyan system provides greater equality of opportunity even though spending disparities are larger.

As noted above, the central government could largely remedy the vertical equity problem while still retaining the public choice advantages of the decentralized system. To reduce vertical inequity, the central government would need to either make unconditional block grants to offset differentials in tax bases of general local governments, or make per pupil education grants, the size of which is inversely related to the tax base per pupil. In the latter case, the central government would need to decide if it would offset tax base advantages for any level of educational spending or only offset tax base advantages up to some specified (foundation) level of spending.

The central government can also use project or other conditional grants for specific educational purposes to help offset tax base and spending differentials. But these grants tend to be administratively cumbersome, inefficient in accomplishing the educational objectives of the central government, and come accompanied by central government restrictions which limit local public choice (see Winkler's analysis of intergovernmental education transfers in Brazil).

Central governments in decentralized systems have sometimes attempted to ameliorate educational inequities. In Brazil, the formula for distributing federal elementary-secondary education monies to the states is highly redistributive and not strongly influenced by political considerations (World Bank, 1986). Both Eastern Nigeria and Kenya took actions to redistribute government grants in favor of lower income community schools. On the other hand, both Chile and Zimbabwe allocate government grants on a per capita basis with no consideration of community fiscal capacity. And Tilak (1986) found no relationship between federal education grants to provinces in India and measures of income levels or educational needs and concluded that grants are primarily allocated on political grounds and only serve to exacerbate spending disparities. Finally, a study of OECD countries found no relationship between forms of government (unitary vs. federal) and governmental efforts to bring about greater educational equality (Noah and Sherman).

IV. Role of the Central Government in a Decentralized System

If political, institutional, and administrative conditions permit a decentralized educational system to operate, that system leads to both improvements and problems in social efficiency, technical efficiency, and equity. The net result depends very much on the circumstances of the particular country, but government can do much to reduce the magnitude of the problems resulting from decentralization without at the same time eliminating its positive features. In particular, government can respond to the problems of decentralization by (i) nationalizing and centralizing elementary-secondary education, (ii) regulating decentralized education, or (iii) establishing incentives for local (or regional) governments to act consistent with central government objectives and social welfare. In all cases, the ultimate decisionmaker is the central government, yet there are significant differences between these three options in terms of the amount of decisionmaking authority given to regional or local authorities.

Problems of Decentralized Educational Systems

There are several reasons to argue for a strong central government role in elementary-secondary education. First, education yields social benefits, which will be underproduced in a completely decentralized system. Second, communities and their leaders may lack the information to select competent teachers and design curriculum and organize schooling; a completely decentralized system may result in inefficient resource allocation. Third, employers and advanced educational institutions may lack the information to evaluate the educational attainment of elementary-secondary school graduates; a completely decentralized system may result in uncertainty regarding the level and type of knowledge acquired by students and may impose additional screening costs on employers. Fourth, there may be horizontal and vertical inequity in educational finance and expenditure; in a decentralized system horizontal inequity may result in an inefficient distribution of specialized skills, and vertical inequity may conflict with societal norms of economic justice.

The question is not whether the central government (or in some cases the regional government) should exercise a strong role in elementary-secondary education but, rather, what should be the nature of that

role. Centralized control and provision of all educational functions may solve some of the problems noted above but at a possibly large cost in social efficiency (mismatch between citizen-consumer preferences and public educational services and a possible mismatch between skills produced and local labor market demand) and technical efficiency (excessively high unit costs and lack of innovation or technological change).

The central government can correct the problems of decentralized education without incurring the costs of social and technical inefficiency associated with centralized finance and provision of all educational functions. To do so requires a combination of regulatory and incentive measures. The policy tools available to government and their application to these problems are summarized in Table 4.

Regulations and Incentives

The central government can improve information available to local decisionmakers, some of whom may be novices in education, by defining minimum standards of school organization, curriculum, teacher qualifications, and achievement levels. For the purposes of informed decisionmaking, these standards need only be defined, not regulated and enforced. The standards should be realistic, minimum standards, not ideal standards; the latter, if unattainable, may provide little useful guidance in decisionmaking. In addition, since parents selecting private schools face the same informational problem as community decisionmakers, these same informational standards should also apply to private schools.

The central government can also help inform the employers of educated youngsters and advanced institutions of learning regarding the level and extent of knowledge. This information is most directly provided through a national or regional system of standardized examinations or uniform criteria for grade promotion or school graduation. Failing the adoption of an examination system or uniform promotion criteria, there is an economic argument for central government regulation and enforcement of minimum standards of school organization and curriculum, in private as well as public schools.

The problem of interjurisdictional spillovers results in local governments, in aggregate, spending inadequate amounts on elementary-secondary education. The central government can respond to this problem

Table 4

Central Government Policies in a Decentralized System

<i>Policy Tool</i>	<i>Policy Goals</i>	<i>Example</i>
Information and Training	Improve local administrative capacity and technical expertise.	Define minimum expected standards of school organization, curriculum, teacher qualifications, and knowledge required for promotion. Train local administrators in personnel and fiscal administration.
Financial Incentives	Increase educational spending to compensate for benefit spillovers.	Provide a central government matching grant for local educational spending up to some desired level, beyond which marginal social benefits are presumed to fall rapidly.
Redistribution	Reduce horizontal and vertical inequities.	Provide central government per student grants to local schools, the value of which varies inversely with the local tax base per pupil (horizontal equity) or inversely with the level of local educational expenditures per pupil (vertical equity).
Regulations and Mandates	Realize positive external benefits from definition of educational standards.	Establish a regional or national system of standardized examinations for grade promotion or school graduation.
Nationalization	Realize economies of scale through centralization of some educational functions.	The central government assumes responsibility for developing the curriculum, teaching materials, and textbooks in some subjects; it might also develop a rational system of standardized examinations.

through either regulation or the establishment of incentives to spend more. Regulation typically takes the form of specifying and enforcing a minimum expenditure per pupil or specifying (as in Brazil) that local governments spend a given percentage of total revenues on education. Matching grants from the central government can be used to provide an incentive to the local government to increase spending, at least up to some minimum level of spending which assures the provision of basic educational services. Both regulation and incentive grants require local governments to employ a standardized accounting system and require the central government to undertake periodic audits of the use of funds.

Aside from the problem of underspending due to spillovers of educational benefits, there may be a general problem of underinvestment by a society in its human capital. If this is perceived to be the case by the central government, it may introduce either regulations or incentives to local governments to increase spending. Regulations may include those mentioned above, such as specifying minimum expenditure levels, minimum tax rates, or minimum user fee levels. In-

centives may include rewards for better tax administration and compliance, matching grants for revenues collected through user fees, or other forms of matching grants. (An example of a disincentive to user fees is found in Indonesia where all the revenue from secondary education user fees is transferred to the central government; parents thus have no incentive to raise user fees in order to improve local education).

Solving the problem of horizontal inequity requires reducing or eliminating the advantage associated with a higher per pupil tax base. This can only be done by the central government in effect redistributing tax revenues from high to low tax base jurisdictions. This redistribution can take several forms. The central government can use its general tax revenues to fund capitation grants for education, the amount of which is inversely related to the per pupil tax base. Or, the government can include per pupil tax base as a variable determining the magnitude of other kinds of cash transfers, including project and matching grants.

Alternatively, if local education tax revenues are primarily derived from a single tax source, the central government could establish a single schedule of tax

rates and revenue per pupil, administer that tax and collect revenues. Of course, given the single schedule, jurisdictions with a high tax base would in effect pay more in taxes than they would receive in revenues, while the opposite would be true for jurisdictions with a low tax base. This solution would effectively eliminate horizontal inequity while preserving the ability of local governments to decide which tax rate and corresponding educational expenditure level they prefer.

Reducing horizontal inequity also helps solve the problem of vertical inequity, but there can simultaneously be horizontal equity and large educational spending differences. Hence, the central government may wish to directly reduce vertical inequity. Possible solutions are to impose direct limits on expenditures per pupil (this is done, for example, in California), to limit tax rates for high tax base jurisdictions, to regulate and limit user fees (possibly including limits on fees and, thus, expenditures in private education), and to provide cash transfers to assure that all jurisdictions attain some minimum level of spending.

Efficiency versus Equity

Two basic problems confront central governments with respect to the finance and provision of elemen-

tary-secondary education. The first is the appropriate tradeoff between efficiency and equity. The second is what measures to use to attain the desired balance.

Social and technical efficiency require some degree of public choice regarding spending, taxing and resource allocation; stimulation of competition and innovation; and possibly incentives to increase educational taxes, user fees, and spending. Horizontal and vertical equity require limiting the degree of public choice and possibly limiting educational revenues and expenditures.

All countries use some combination of centralized control, including direct finance and provision, regulations, grants and other incentives to attain some desired combination of efficiency and equity. That desired combination is a social and political decision. The important question is not so much the selected combination but whether or not a country could not attain more of one without suffering less of the other. In many countries large inequities in educational spending exist in spite of a highly centralized educational system adopted in the name of equity. In some cases it may be possible to decentralize some educational functions, improve efficiency, and not worsen spending inequities.

V. The Consequences of Decentralization

Controlling for other factors, a policy of educational decentralization is expected to result in improved educational efficiency and worsened equity. Unfortunately, the experience of countries to date provides very little empirical evidence on the economic consequences of decentralization. And there is no predictive theory or model that enables us to make confident conclusions about the independent effects of decentralization.

One problem in assessing the effects of decentralization is defining what constitutes a policy. At one extreme, significant educational reform can take place in the absence of formally stated policies or comprehensive plans (see the McGinn, Schiefelbein, and Warwick analysis of major educational policy changes in the absence of plans in Chile and El Salvador). At the other extreme, grandiose policies are sometimes suddenly announced and just as quickly dropped. And between these extremes are the policies which are carefully formulated but only half-heartedly implemented. Simply the difficulty in defining decentralization policy presents an important *caveat* to drawing firm conclusions from actual country experience.

Aside from the question of what constitutes policy is the matter of the criteria to use to evaluate policy success. Policies can be evaluated in terms of stated government objectives, underlying political goals, or more objective educational and economic criteria. Of these three, stated government objectives are the least useful for evaluation purposes. Stated objectives are often vague and general. For example, the stated objectives for decentralization in Mexico are (according to Prawda):

- E improve educational development in the states;
- E make plans and solve problems where they occur;
- E improve the efficient and effective use of resources; and
- E increase the participation and responsibility of the community in education.

Notwithstanding the difficulties in defining policies and stating precise educational objectives, there is a large literature analyzing which factors appear to de-

termine success in implementing decentralization policies. These studies do not, in general, consider the educational (*including* efficiency and equity) impacts of decentralization. Rather, they consider which factors appear to determine success in changing the organization and distribution of decisionmaking power in education. These factors are summarized here. In addition, the question of implementation strategies is briefly discussed.

Factors Influencing Implementation

A variety of factors affect public policy implementation in developing countries, a number of which were discussed earlier as possible constraints to the optimal centralization or decentralization of education. These factors include the system of public finance, the political context, government and administrative structures, and the historical and cultural context. (see Cheema and Rondinelli, 1983, for an up-to-date survey of studies on the implementation of decentralization in developing nations).

Public Finance

A minimum requirement for deconcentration in education is the transfer of resources and resource allocation authority from the central ministry to its regional or local directorates. For devolution and the effective transfer of independent decisionmaking power local or regional authorities must have their own source of revenues. That source of revenues may be earmarked central government tax revenues (as in Brazil), user fees or involuntary contributions or own-source tax revenues. The regional education directorates in the unsuccessful Peruvian decentralization effort had no source of local revenues, nor did they have their own budgets. On the other hand, successful attempts at promoting local education in Africa have typically entailed communities making liberal use of user fees and involuntary association cash and non-cash contributions.

Political Context

Political and organizational support are critical determinants of policy implementation. Decentralization alters the distribution of power and leads to natural conflicts between educators and parents and between

ministry and local officials. Three interest groups are especially important: teachers, ministry officials, and local officials.

Teachers play a critical role in implementing any decentralization plan, and a failure to include them in policy formulation can doom efforts at decentralization. They were ignored in the Peruvian decentralization effort and subsequently used the newly created community organizations to oppose the government (McGinn and Street, 1986). Ministry officials have the most to lose in decentralization, and active resistance by factions within the ministry represent a major threat to implementing decentralization. In constructing an implementation strategy, it is important that key ministry officials have an incentive to see the program succeed.

In addition, to political support by important interest groups, political continuity at the national level is required. Venezuela, for example, experienced several changes in political administration in the 1970s, although there was consistent support for a policy of deconcentration to regional and local directorates. Decentralization plans were announced with every change in administration in 1969, 1974, 1977, and 1979. Support for decentralization was consistent and financial resources were abundant, but every new minister of education announced a revision of the previous decentralization plan. As a result, decentralization was never implemented (Hansen).

Political instability in Venezuela took the form of frequent changes in ministers within a democratically elected government. In other countries political instability takes the form of frequent changes from authoritarian military regimes with a need for centralized control to popular democracy and the mandate to return power to the people.

Frequent political and policy changes often destroy fragile local government and community organizations; it is in general far easier to centralize than to decentralize. An example of how policies change is Pakistan, which gained independence in 1947 with elementary education provided by private schools and local schools run by district councils and municipal governments. Education was centralized to the provincial level in 1962, and in 1972 all private schools were nationalized. In 1979, the government again legalized private schools.

Government and Administrative Structures

Successful implementation of decentralization requires precise and concise laws and regulations governing the effort, effective and frequent communica-

tion between the center and the decentralized units, and incentives for administrators to implement the new policies.

Specificity of laws and regulations are important. If the descriptions of new roles, activities and coordinating activities under decentralization are unclear, there may be little effort to alter actions. Vagueness in implementation plans and directives permit an organization to claim existing activities meet those directives (Montjoy and O'Toole, 1979). In the case of Peru, the regional and local directorates created by the decentralization plan suffered from ambiguity as to their role. The ministry of education used them as its administrative arms. They were never given the opportunity to fulfill decentralization objectives because they were always responding to ministry requests for more plans and data. Drawing from the experiences of successful countries, Bray (1985) specifies the kinds of details required for successful introduction of community schools.

Historical and Cultural Context

Culture refers to the traditional role of communities and citizens' attitudes towards authority. According to observers, decentralization was relatively successful in Eastern Nigeria, in part due to a tradition of community competition (Okoye, 1986). This native tradition was further fostered by the colonial practice of communities constructing and paying the recurrent costs of mission schools. Another positive feature is that communities are small and blood-related, making it easier to control the free-rider problem common to the provision of collective goods (Igwe). Success in Eastern Nigeria can be contrasted to the failure of Peruvian education decentralization. One of the factors contributing to lack of success in Peru was a political culture highly deferential to authority and center-based decisions (Stromquist, 1986).

Culture also has much to do with the origins of decentralization policies in the first place. In Kenya, for example, the pressure for decentralization originated with the community, not the central government. When decentralization policies come from the bottom-up rather than the top-down there are higher expectations for participation and stronger pressures for implementation (Conyers, 1983).

Implementation Strategies

Implementation of decentralization policies requires a plan of action. Rondinelli (1986) notes at least four important elements to a successful strategy:

(i) concentrate initial efforts on small scale activities for which there is popular support and recognized need; (ii) gradually expand the scope of decentralized activities as local managerial and financial capacity increase; (iii) alter the mission of the central government ministry to support and facilitate the decentralized units, as opposed to direct provision and control; and (iv) train both local and central government administrators and officials to change attitudes as well as improve the skills required in a decentralized environment.

The United States' Experience

Elementary and secondary education in the United States are usually viewed as being highly decentralized, with local government, usually special school districts, raising revenues and providing education. The federal government plays only a very minor role in elementary-secondary education, although state governments have assumed an increasingly active role in regulating and financing education provided at the local level.

Some urban school districts, however, are very large with enrollments as large as some countries and encompassing a large number of ethnic and income groups. These large districts are effectively run by professional staff and the teachers' union with little opportunity for parental participation. (See Clark's description of this situation.) Frustration was so high that a movement arose to create independent community schools, not unlike the "harambee" schools of Kenya. Largely in response to minority group pres-

sure, an attempt was made in several cities in the late 1960s and early 1970s to decentralize and give community groups more say in operation of neighborhood schools. One city -- New York -- even permitted neighborhoods to elect local school boards to formalize community participation.

The dynamics of decentralization efforts in the United States were not unlike those in developing nations today. Most announced efforts at decentralization were attempts at administrative decentralization with no provision for parental participation (see Fantini and Gitell, 1973). Major opposition to decentralization came from those groups most at risk in losing power -- school teachers and administrators. In other words, much like decentralization efforts in other countries, the United States experience relied upon the opponents of decentralization to implement it.

The effects of decentralization efforts in the United States were neither large nor permanent, in part a result of insufficient funding. Creation of smaller decisionmaking units did not necessarily increase citizen involvement in education, although different citizens (community activists) did become involved (La Noue and Smith, 1973). The reforms appeared to bring about some minor curriculum changes, but no empirical evidence exists on the impact on student achievement.

In short, decentralization in United States cities experienced many of the same implementation problems as decentralization efforts in developing countries. And the evidence as to the empirical effects of decentralization efforts is no better for the U.S. than the developing countries.

VI. Research Agenda

In theory, decentralization has the potential to improve both the finance and efficiency of public education, as well as the potential to worsen equity. In reality, we know very little about the effects of decentralization on efficiency and equity. A number of case studies exist describing why decentralization policies were formulated, how they were implemented, why implementation was successful or not, and which interest groups appeared to win or lose as a result. These studies permit some generalizations about the politics of decentralization but permit almost none about the educational or economic consequences. Given the lack of generalizable results and the lack of a predictive model of the effects of decentralization, advocacy or opposition to decentralization must be based on either theoretical or political grounds.

As a policy, decentralization is faddish. It was initially advocated in developing countries in the 1950s as a means of establishing and reforming local government. With the sudden popularity of national planning in the 1960s, attention became focused on improving planning and administration at the center. When it was discovered that national planning could not in and of itself solve persistent educational problems, attention in the 1980s once again became focused on decentralization.

What We Need to Know

Before decentralization can be endorsed (or opposed) as good public policy, there is much that needs to be learned from existing decentralized systems and past attempts at decentralization. In addition, it may be necessary to undertake small scale experiments in decentralization in order to answer some of the more important questions regarding effects. The most important questions to which answers are needed are given below.

1. What is the impact of decentralization on social efficiency?

In theory, decentralization should lead to an improved match between consumer-citizen preferences and the quality and quantity of educational services provided. But the magnitude of this improvement is unknown, as is how the magnitude may vary with the type of decentralization undertaken.

2. How does decentralization affect technical efficiency and costs?

Decentralization should, in theory, also result in improved technical efficiency and lower unit costs for a given quality of education. But under which types of decentralization and which types of institutional arrangements does this in fact occur? Are total administrative costs higher or lower in decentralized systems? Are community resources more or less effectively used in decentralized systems?

3. What is the relationship between decentralization, competition between communities, and innovation?

Decentralization should, also, lead to greater competition between communities and greater innovation in the delivery of educational services. To what extent does this occur? How can competition and innovation be fostered in a decentralized system? What is the evidence from the decentralized systems that currently exist?

4. Under which conditions does decentralization lead to increased community finance and increased per pupil educational spending?

From the perspective of governments faced with expenditures growing more rapidly than revenues, the prospect of shifting finance of education to local communities is attractive indeed. Which conditions are required for communities to take the initiative in raising educational revenues? How can the central government facilitate such action by communities? Does the shifting of financing responsibility from central to regional or local governments lead to higher or lower spending per pupil? None of these questions have been answered, although careful study of decentralization experiments might yield some tentative answers.

5. To what extent are intergovernmental transfers consistent with decentralized decisionmaking?

Most countries decentralize educational finance through the use of intergovernmental grants to re-

gional and/or local governments. Most commonly, these grants are conditional on required actions or performance by the recipient of the grant, but this conditionality itself limits decisionmaking independence. How can grants be organized to transfer resources while maintaining decisionmaking independence by the grantee? Under what conditions would such unconditional grants be politically acceptable?

6. How does decentralization affect horizontal and vertical equity?

Decentralization is predicted to increase horizontal and vertical inequity. To what extent has this proven true in decentralization programs? Are inequities larger in decentralized or federalized developing countries than in centralized or unitary governments? What has been the impact of redistributive central government grants on spending inequities between regions or communities?

7. Can the virtues of decentralization be attained in a centralized system?

Decentralization in the form of devolution is predicted to have a number of positive effects on educational efficiency, finance, and management. To what extent can these advantages be attained in a centralized system? In other words, to what extent does decentralization of decisionmaking have to occur in order to realize significant efficiency gains? Which

educational functions should be centralized or decentralized in order to yield gains in efficiency and management?

Research Design

At least four basic research designs could be devised to answer the above questions. The first is to simply monitor and evaluate ongoing or past decentralization efforts, focusing on the above questions. Existing studies of decentralization cases have not focused on these questions and rarely provide empirical conclusions. The second is to undertake a systematic comparative study of centralized and decentralized educational systems, again with an emphasis on the collection of data aimed at answering the above questions. The third is to monitor (and possibly fund small scale) new decentralization efforts. Finally, the centralization or decentralization of particular educational functions could be studied. For example, a study to examine the determinants of local community financial support of education might be undertaken either across communities within a particular country or across countries demonstrating large variance in financial support.

Specific research designs could be developed to attempt to answer each of the questions posed above. Clearly, the appropriate design would depend on the country or countries being studied, their institutions, and the type of decentralization undertaken.

References

- Ayot, H.O., and K. Lillis, "Community Financing of Schools: Issues from Kenya," paper prepared for the workshop on *Community Financing of Schools*, Gaborone, Botswana, June 1985.
- Bahl, Roy, Jerry Miner, and Larry Schroeder, "Mobilizing Local Resources in Developing Countries," *Public Administration and Development*, Vol. 4, 1984, pp. 215-230.
- Bahl, Roy, and S. Nath, "Public Expenditure Decentralization in Developing Countries," *Environment and Planning: Government and Policy*, Vol. 4, 1986, pp. 405-418.
- Bray, Mark, *Educational Planning in a Decentralised System: The Papua New Guinean Experience*. Sydney: Sydney University Press, 1984.
- Bray, Mark, "A Resource Book on Community Financing for Governments and Voluntary Agencies." Paper delivered at the Botswana conference on *Community Financing of Schools*, June 1985.
- Breton, Albert, "A Theory of Government Grants," *Canadian Journal of Economics and Political Science*, May 1965, pp. 175-187.
- Buchanan, James M., "Federalism and Fiscal Equity," *American Economic Review*, September 1950.
- Beyna, Larry, et. al., *Managing Decentralization: An Annotated Bibliography*. Syracuse: Maxwell School, Syracuse University, 1977.
- Carron, Gabriel, and Ta Ngoc Chau, *Regional Disparities in Educational Development: A Controversial Issue*. Paris: UNESCO/International Institute for Educational Planning, 1980.
- Cheema, G. Shabbir and Dennis A. Rondinelli (eds.), *Decentralization and Development: Policy Implementation in Developing Countries*. Beverly Hills: Sage, 1983.
- Clark, Kenneth, *Powerlessness in the Ghetto*. New York: Praeger, 1978.
- Conyers, D., "Decentralization: The Latest Fashion in Development Administration?" *Public Administration and Development*, Vol. 3, 1983, pp. 97-109.
- Conyers, D., "Decentralization and Development: A Review of the Literature," *Public Administration and Development*, 4, 1984, pp. 187-197.
- Fantini, Mario and Marilyn Gittell, *Decentralization: Achieving Reform*. New York: Praeger Publishers, 1973.
- Gomez-Buendia, Hernando and Rodrigo Losada-Lora, *Organizacion y Conflicto: La Educacion Primaria Oficial en Colombia*. Bogota: Centro Internacional de Investigaciones para el Desarrollo, 1984.
- Guthrie, James, *School Finance Policies and Practices*. Cambridge: Ballinger Publishing, 1980.
- Hansen, E. Mark, "Administrative Reform in the Venezuelan Ministry of Education: A Case Analysis of the 1970s," *International Review of Education*, xxx (1984), pp. 119-140.
- Hanson, Mark, "Organizational Bureaucracy in Latin America and the Legacy of Spanish Colonialism," *Journal of Interamerican Studies and World Affairs*, Vol. 16, No. 2 (May 1974), pp. 199-219.
- Hinchliffe, Keith, "Federal Finance, Fiscal Imbalance, and Educational Inequality," The World Bank, Education & Training Series Discussion Paper No. EDT 72, 1987.
- Hurst, Paul, "Decentralization: Panacea or Red Herring?" in Lauglo, Jon, et. al., *The Control of Education*, pp. 79-85.
- Igwe, S. O., "Community Financing of Schools in Eastern Nigeria," paper prepared for the workshop on *Community Financing of Schools*, Gaborone, Botswana, June 1985.
- Jimenez, Emmanuel and Jee-Peng Tan, "Educational Development in Pakistan: The Role of User Charges and Private Education," The World Bank, Education and Training Series Discussion Paper No. EDT 16, 1985.
- Jimenez, Emmanuel and Jee-Peng Tan, "Decentralized and Private Education: The Case of Pakistan,"

Rondinelli, Dennis A., John R. Nellis, and G. Shabbir Cheema, *Decentralization in Developing Countries: A Review of Recent Experience*. World Bank Staff Working Paper No. 581. Washington, D.C.: World Bank, 1984.

Saqeb, G.N., "The Effects of Tensions Between Nationalism and Provincialism on Educational Administration in Pakistan" in J. Lauglo, et.al., *The Control of Education*, pp. 33-44.

Schoefthaler, Traugott, "Propositions for Revitalizing Research on Educational Decentralization," paper presented at International Institute for Educational Planning, Paris, December 1985.

Smith, B., "The Measurement of Decentralization," *International Review of Administrative Sciences*, Vol. 15, 1979, pp. 213-222.

Stephens, David, "Decentralization of Education in Northern Nigeria" in Lauglo, et.al., *The Control of Education*, pp. 159-168.

Stromquist, Nelly P., "Decentralizing Educational Decision-Making in Peru: Intentions and Realities," *International Journal of Educational Development*, Vol. 6, No. 1, 1986, pp. 47-60.

Tilak, Jandhyala B.G., "Centre-State Relations in Financing Education in India." New Delhi: National Institute of Educational Planning and Administration, 1984.

Tilak, Jandhyala B.G., "Public Financing of Education in a Federal State: The Case of India." New Delhi: National Institute of Educational Planning and Ad-

ministration, 1986.

United Nations, *Decentralization for National and Local Development*. New York: United Nations Department of Economic and Social Affairs, Division for Public Administration, Technical Assistance Program, 1982.

Veeraraghavan, J., "India: Mechanism for the Allocation of Resources to Education from the Federation to the States." Paris: IIEP, UNESCO, 1982.

Vieira, P., *Toward a Theory of Decentralization: A Comparative View of Forty-Five Countries*. Ph.D. dissertation. School of Public Administration, University of Southern California, 1967.

Winkler, Donald R., "The Distribution of Educational Resources in Paraguay," *Comparative Education Review*, Vol. 24, No. 1 (February 1980), pp. 73-86.

Winkler, Donald R., "Fiscal Federalism and Primary Education Finance: Brazil and the United States," paper presented at the Universite de Dijon, June 1986.

World Bank, *World Bank Development Report 1983*. Washington, D.C.: 1983.

World Bank, *Brazil: Finance of Primary Education*. Washington, D.C.: The World Bank, 1986.

Zagefska Yannakopoulos, Polymnia, "Eleven Experiences in Innovations in Decentralization of Educational Administration and Management of Local Resources," mimeo. Paris: UNESCO, August 1980.

Decentralization in Education: An Economic Perspective

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Summary

Educational decentralization policies have been adopted or are under consideration in a number of the developing countries. Educational development projects inevitably have some impact on the degree of centralization in education. These facts provide the rationale for a critical assessment of decentralization and an evaluation of developing countries' experience. This paper defines educational decentralization, presents economic criteria for evaluating decentralization policy, assesses the results of decentralization policies, discusses factors which influence successful implementation of decentralization, and makes recommendations for further research to guide Bank lending policy.

For the purposes of this paper, decentralization policies will be categorized as those which: (i) delegate decisionmaking to autonomous, public entities, (ii) deconcentrate decisionmaking to subnational directorates of the central government, and (iii) devolve decisionmaking to local governments or community organizations. Devolution receives the most critical attention in this paper.

The degree of centralization in educational systems typically varies with the decisionmaking areas, including school organization, curriculum and teaching methods, examinations and supervision, teacher recruitment and compensation, finance of recurrent expenditures, and school construction and finance. The desirability and feasibility of decentralization in these

areas depends on the structure of government finance, political environment, government and administrative structure, and the historical and cultural context. Given these conditions, economic criteria can be used to evaluate decentralization plans.

Three economic criteria are used to evaluate decentralization -- social efficiency, technical efficiency, and equity. These criteria argue for some decisionmaking areas (finance, teacher recruitment) provided at the local level, with other areas (school organization, curriculum) supplied at the regional level, and a system of central government grants to correct some of the efficiency and equity problems inherent in a decentralized system.

Little is known about the economic and educational consequences of decentralization, in spite of a wide variety of country experiences. The effects of decentralization are difficult to isolate, and scholars have instead focused on implementation issues. Decentralization policies are most successfully implemented if there is a tradition of self-reliance by local communities; if local governments or communities have their own sources of tax revenues and voluntary contributions; if the pressure for decentralization originates with the community rather than ministry planners; if all important affected political groups, especially teachers, are involved and informed about development of decentralization plans; and if administrative capacity at the local level either already exists or is trained.

I. Introduction

In recent years there has been renewed interest by countries, international aid organizations, and scholars in decentralization of government, including public education. Countries on every continent have either considered or attempted to implement some form of educational decentralization. In 1972, Peru established regionalized directorates and community nuclei to reduce bureaucracy and incorporate disadvantaged groups in society. In 1974, the Philippines established thirteen regional offices of the Ministry of Education to undertake regional planning and administration. In 1977, Nigeria modified its constitution to establish local governments, whose main function is provision of primary education. And, in 1980, Chile instituted the most radical decentralization policy to date, assigning the responsibility for elementary and secondary education to municipalities, along with local revenue sources to support them.

International aid organizations have, by and large, been supportive of such decentralization policies. The United States Agency for International Development (USAID) has generally favored strong community involvement in educational planning (see Kortan and Alonso, 1981), and a recent director of the Agency strongly supported decentralization efforts. UNESCO has generally favored decentralization as one means of incorporating marginal groups in public decisionmaking and improving the quality of services they receive (see the 1982 UN Report). The World Bank has no official position on educational decentralization but has generally been sympathetic to decentralization efforts (see the 1983 *World Bank Development Report*).

Finally, scholars have repeatedly studied the decentralization phenomenon, recently with an emphasis on both political motivation for and the implementation of decentralization efforts. The scholarly interest of the 1980s is in contrast to scholarly articles of the 1950s, which expressed most interest in decentralization and establishment and strengthening of local governments as a means towards democratization (see Conyers, 1984). Scholarly interest parallels government interest in decentralization in those two time periods. During the 1960s and 1970s scholars and countries were more interested in central government planning, including educational planning, and implications of such planning for centralized control of resources. The implications of planning for centralization were complemented by African independence and resulting efforts to eliminate colonial influences

through the nationalization of schools. Ironically, colonial administrative structures were used to implement such centralization policies.

Rationale for Decentralization

Countries may adopt decentralization policies for a variety of reasons, some explicitly expressed in policy statements, some of which are only implicitly revealed through administrative actions. The rationale for educational decentralization can be grouped into three broad categories: (i) educational finance, (ii) efficiency and effectiveness, and (iii) redistribution of political power.

Financial arguments for educational decentralization are a recent phenomenon. The proportion of school-age children enrolled in primary and secondary schools has grown rapidly over the past two decades, and educational expenditures have grown rapidly as well. Central governments now find themselves facing severe fiscal constraints to continued expansion of educational opportunities. Hence, shifting part of the burden for support of primary and secondary education to subnational units of government, to community and voluntary organizations, and to parents has become an increasingly attractive alternative. The form of shifting advocated in decentralization plans varies with a variety of country characteristics, including the form of government, colonial administrative heritage, and traditions of community involvement.

Efficiency arguments for decentralization typically focus on the high unit costs of primary and secondary education provided by the central government. One explanation for such high costs is inadequate national government capacity to administer a centralized educational system. Another explanation is the costs of decisionmaking in a system where even the most minor local education matters must be decided by a geographically and culturally distant bureaucracy in the capital city. Yet another explanation is the frequent application by education ministries of national standards for curriculum, construction, teacher quality, etc., thereby preventing cost savings through adjustments of educational inputs to local or regional price differences.

The effectiveness rationale for decentralization argues that the centralized planning policies popular in the 1960s have resulted in expensive education, which is decreasing in quality. After independence, many countries (e.g., Guyana) nationalized and cen-

tralized their educational systems and established free education as a right. Given current fiscal constraints, such a policy can continue to be followed only with decreasing educational quality. Administration and accountability can be improved in education, it is argued, by making schools more responsive to parents and local communities and eliminating the need for central government decisions on local educational matters. These arguments are buttressed by evidence of greater cost-effectiveness in the private sector. In Senegal, for example, unit costs are higher and exam pass-rates are lower in public than private, religious schools.

An example of these arguments for decentralization is given in the sixth five-year plan of Pakistan:

The nearly comprehensive nationalization of educational institutions and the accompanying policy of free education ten years ago had at least two casualties. An already impoverished Government was landed with a large financial burden which restricted it from expanding education. And many of the schools of high quality, some of them run by education-conscious communities, lost their excellence under the public control. This, in both quantity and quality, was counter-productive. (Government of Pakistan, *The Sixth Five-Year Plan, 1983-1988*, Planning Commission, Islamabad, pp. 318-319, as quoted in Jimenez and Tan (1987).)

Redistribution of political power is rarely stated as an objective of decentralization, but democratization or inclusion of marginal groups in society is a frequently stated goal. An example is the 1972 Peruvian educational reform which explicitly attempted to include Indians and other disadvantaged groups in education decisionmaking. McGinn and Street (1986) argue that redistribution of political power is the primary objective of decentralization. With that as the objective, decentralization may be undertaken to empower those groups in society which support central government policies or to weaken groups posing obstructions to those policies. Thus, decentralization in Mexico has served to reduce the power of the teachers union by transferring salary negotiations from the central to the state government level. From this perspective, decentralization is less concerned with the transfer of power from one level of government to another than it is with the transfer of power

from one group to another. And, ironically, one consequence of decentralization may be to increase the effective control of the central government, or at least that of key decisionmakers within the central government.

Questions to be Answered

This paper does not deal further with the issue of why countries choose to decentralize. Rather, the focus here is on whether decentralization is wise educational policy. Examination of this issue requires that a number of specific questions be answered. Among the questions requiring answers are:

- E What is meant by the term decentralization? What, specifically, does it mean in the context of public education?
- E What kinds of decentralization are in fact undertaken by developing countries?
- E What is the desirable level of centralization or decentralization from an analytic perspective? How is the answer to this question affected by the economic, political, and administrative institutions of most developing countries?

Typically, there is divergence between stated goals and actual outcomes of government policies. What are the political, economic, and educational consequences of decentralization?

Decentralization itself leads to problems. What is the proper role of the central government in correcting those problems in a decentralized educational system? Which factors appear to most strongly influence successful implementation of decentralization policies in terms of stated goals?

Finally, after reviewing the literature on educational decentralization, what is the status of our knowledge? And what should the priorities be for further research and study on the subject?

The term decentralization has several definitions, as shown below, but most commonly it refers to the devolution of some degree of decisionmaking power to the local government or community organizations. Unless stated otherwise, this is the definition used in this paper.

II. Definition of Decentralization

Centralization-decentralization can be viewed as a spectrum ranging from a unitary governmental system where the central government has most power or decisionmaking authority to a governmental system where local governments and community organizations exercise large amounts of power. The ultimate centralized system is one in which all decisions are made in the nation's capital, and the ultimate decentralized system is one where all decisions are made by individuals, community organizations, and small local governments.

Definitions

Since most countries are relatively centralized in terms of public decisionmaking, most policy discussion concerns alternative means of decentralizing, not centralizing. Four types of decentralization are typically identified in the literature (Rondinelli, 1984): deconcentration, delegation, devolution, and privatization. If successfully implemented, each of these types of decentralization results in a unique system for financing and for delivering education. In what follows, I will attempt to define these terms and give examples of educational systems corresponding to each type.

Centralized Decisionmaking

In a centralized governmental structure, education is financed and managed from the center. The nature of education is such that some decisionmaking power must be given to school teachers and administrators, but typically they can make only the most routine decisions and have no or little control over resource allocation in the schools. An example of a centralized country is Cameroon, where almost all educational revenues are derived from central government revenues (excepting some fees in former Anglophone provinces), and the central government determines curricula, sets and evaluates exams, and recruits, assigns and promotes teachers and administrators. There are administrative representatives of the Ministry of Education outside the capital city, but their fiscal and decisionmaking independence is very small.

Delegated Decisionmaking

Delegation is the transfer of government tasks or functions to autonomous organizations such as public corporations and many regional development agen-

cies, which may then receive public funding and are ultimately accountable to the government. The most commonly delegated areas in the education sector are vocational and higher education. Autonomous training agencies, such as SENA in Colombia and SENAI in Brazil, have been established in a number of developing countries. These agencies typically are assigned a general task (e.g., vocational training), given an independent source of revenue (often an earmarked payroll tax), and report to a board of directors rather than any particular minister. Similarly, universities are often autonomous bodies which receive direct funding from the government but are subject to little direct control.

Examples of delegation in elementary-secondary education are not readily found. In Lesotho most elementary education is delegated to the churches, with teacher salaries paid by the government; this pattern was not uncommon elsewhere in Africa prior to independence. In other countries, it is not uncommon for the government to pay all or some portion of teacher salaries in religious schools, even when public schools exist as well. Examples are Papua New Guinea, where teacher salaries in religious schools are paid by the government, and Paraguay, where some teachers in religious schools receive pay from the government (Winkler, 1980).

Deconcentrated Decisionmaking

Deconcentration refers to the transfer of authority to lower levels within central government agencies. Often this takes the form of creating or expanding powers of regional directorates. This has been an especially common form of decentralization in Latin America. Among the countries which have established regional directorates of the education ministry are Peru, Colombia, Chile, and the Philippines. These directorates vary in power, but they often have the responsibility of supervision and planning for the region.

Devolved Decisionmaking

Devolution implies the creation of autonomous and independent subnational units of government, which have authority to raise revenues and spend. Devolution may result in a strong central authority and community-financed and managed schools. It may, also, result in a federal form of government in which general purpose regional or local governments have re-

responsibility for the finance and provision of elementary and secondary education. The similarity between devolution and federalism is demonstrated by a popular economic definition of federalism:

A public sector with both centralized and decentralized decisionmaking in which choices made at each level concerning the provision of public services are determined largely by the demands for these services by the residents of (and perhaps others who carry on activities in) the respective jurisdiction. (Oates, 1972)

There are a number of examples of federalism among developing countries including Brazil, India, Malaysia, Nigeria, Pakistan, and Papua New Guinea. In each of these countries decisionmaking authority is divided between the central government and regional governments. Local governments, also, typically exist in some form, but in most countries their power and authority is determined by the regional government; furthermore, regional government is often highly centralized, even in a decentralized, federal system.

Elementary and secondary education may be devolved to regional governments, local governments, or both. In India, education was devolved to the state governments in the constitution of 1950, although the central government still plays an important role in determining the size of revenue transfers to the states for education. Primary and secondary education have also been devolved to the provincial level in Papua New Guinea. On the other hand, primary education is devolved to local government in Brazil and Nigeria, while secondary education is largely the responsibility of the regional or state governments. In Brazil, the organization of primary education varies by state, but in most states there exist parallel local and state primary school systems with local schools funded largely from local government revenue sources and state schools funded by state revenue sources; both school systems also receive some transfers from the central government. In Nigeria, the local government is responsible for managing primary schools and providing revenues for school construction and materials and supplies, but most operating revenue comes from state government transfers, and state revenues in turn are largely derived from the central government.

The Eclectic Model

Some countries do not fit well any of the descriptions given above. In particular, some countries have centralized and nationalized systems of primary education but decentralized systems of secondary education, in large part because the central government

does not have sufficient revenues to fully fund secondary education. Both Kenya and Indonesia, for example, have free, nationalized primary education and more decentralized provision of secondary education. For example, in Kenya the central government has established conditions to foster development of community-based ("harambee") and financed secondary schools, but such schools will probably be nationalized or managed and financed by the central government as the central government budget permits.

An important feature of the eclectic model is the parallel existence of several types of schools. For example, in Kenyan secondary education, one finds central government schools (23 percent of the total), community "harambee" schools (50 percent), and subsidized community or private schools (21 percent) (Ayot and Lillis, 1985). Another feature of this eclectic model is government subvention, usually in the form of teachers salaries, of education provided by private, usually religious, schools. In some cases, subventions may cover almost the entire cost of teacher compensation, yet management lies with the private school. For example, in Indonesian secondary education one finds a combination of government schools (56 percent of the total) and private schools (44 percent), with the private schools receiving significant government subventions (20 percent of total compensation costs) in the form of payment of teacher salaries. In addition, even students in Indonesian government schools pay sizeable enrollment fees, constituting as much as ten percent of recurrent expenditures (Meesook, nd).

Another version of the eclectic model is, in principle, the educational system which has centralized decisionmaking but which has many of the characteristics of decentralized systems: salary scales which vary by location, local provision of some educational services through contracts with the central government, and substantial community input to local school finance without commensurate local control. In practice, systems with centralized decisionmaking rarely permit these characteristics to exist.

Measures of Decentralization

A measure of decentralization would ideally measure control or decisionmaking authority. One plausible measure of control over resource allocation is the percent of expenditures born directly by users and local (or regional) government. Three problems exist with this measure. The first and most serious is that central government regulations and mandates on subnational units of government may result in those units having very little control over resource allocation

or spending in spite of seemingly high direct financial contributions to education. For example, if the central ministry of education mandates class size and teacher salary, which represents a high proportion of recurrent expenditures, the subnational government may have control over very few resources.

A second problem has to do with the treatment of central government transfers to subnational governments. Subnational units of government may receive transfers in the form of block grants, categorical education grants, and earmarked tax revenues. If such transfers are relatively stable over time, they may be *de facto* own-source revenues of the lower unit of government; this is especially true if the transfers are fungible such that the lower unit of government can in fact use a special grant for general purposes. But if the magnitude of, say, earmarked revenues varies with political and educational conditions, such revenues may be *de facto* central government revenues, in spite of the fact that government accounts show them being directly distributed to the lower units of government.

A third difficulty is that the degree of fiscal decentralization is determined not only by the proportion of funding directly provided by lower units of government but, also, by the number of lower units of government. Other things equal, the larger the number of units of government, the more control local citizens have over resource allocation decisions in their local schools.

An alternative measure of decentralization would more directly reflect the distribution of decisionmaking authority. This measure would reveal the degree of central government control over major kinds of educational decisions: curriculum, construction and construction standards, teacher assignment and pay, etc. Decisionmaking with respect to the various educational functions is discussed in more detail later.

Regional versus Local Autonomy

Educational decisions can be made at several levels -- national, regional, local, the school or school district, and the family. Decentralization refers to the decisionmaking authority of subnational units of government, but quite clearly decisionmaking by regional governments in India is quite different from decisionmaking by the community in the "harambee" schools of Kenya. Furthermore, there may be conflict between decentralization at the regional and the local levels. In Chile, for example, municipalization of education came at the expense of the regional directorates, which were established earlier (Magendzo and Egana, 1985). In India, the 1950 constitution assigned elementary and secondary education as a re-

sponsibility of the state governments, and the local government contribution to education has consequently declined over time (Tilak, 1984).

The rationale for decentralization may differ markedly depending on the level to which educational decisionmaking responsibilities are assigned. Decentralization to the regional level is most frequently undertaken for reasons of administrative convenience (as in Latin America) or to appease subnational cultures (e.g., India and Papua New Guinea). Decentralization to the local level is more commonly undertaken as a means of democratization and increasing citizen participation, especially of ethnic or disadvantaged minorities, and as a means of stimulating larger financial contributions by the community.

In most developing countries, local governments have relatively little independence. Even among federal countries, constitutions rarely specify the powers of local governments (Brazil and Nigeria are exceptions); most constitutions spell out only relations between the regional and central governments and leave the assignment of local government powers, to the regional government. In fact, it's not clear that local governments have any more power in federal than unitary systems. Local governments are frequently dependent on regional governments for some services, the pass-through of some central government grants, approval of tax increases, and appointment of chief government officers.

Primary and secondary education may be the responsibility of the central, regional, or local governments in a federal system. And, when the responsibility is assigned to local authorities, those authorities may be elected by local citizens (as in Brazil and Sri Lanka), appointed by regional authorities (as in Malaysia and Korea), or some mix of the two (e.g., India where local councils are elected but the chief administrative officer is appointed by the state). Furthermore, education may be assigned to a general purpose government (such as a municipality) or to a special purpose government or special district; the latter is uncommon among developing countries, although community schools financed by some combination of contributions and compulsory fees resemble the special district. Special districts are, however, used in the provision of some urban services and could conceivably also be used in education.

Decentralization of Education Functions

In discussing centralization-decentralization in education, it is useful to disaggregate the provision of educational services into its various components or functions. For the purposes of this analysis, these

components are labeled: school organization; curriculum and teaching methods; examinations and supervision; teacher recruitment and compensation; finance of recurrent expenditures; and school construction and finance. The degree of centralization of decision-making differs by component. For example, curriculum decisions may be highly centralized at the same time that school construction and finance is very decentralized. It is the mix of decisionmaking powers with respect to the various components which leads to a summary description of an entire educational system as being centralized or decentralized. Table 1 suggests the mixes most commonly found in educational systems described as centralized, decentralized, and mixed.

For any given country, the degree of centralization with respect to each component can be determined through the examination of educational plans and operational guidelines of the ministry of education. But there is often a discrepancy between what is written or reported and what is practiced. In particular, the central government often sets guidelines for curriculum, teacher qualifications, school construction standards, etc., which are unrealistically high given the income and human resources of the country. The result may be that what appears to be strict central government regulations and mandates are not enforced and are in fact largely ignored by the providers of educational services.

School Organization

School organization refers to the establishment of minimum schooling requirements, the structure of elementary-secondary schooling, and the rights of children to education. Excepting a very few federalist systems (e.g., the United States), decisions about school organization are highly centralized. However, in spite of a high degree of centralization, large differences in compliance with organizational standards, especially in providing educational opportunities to all children, are found in all school systems. (e.g., inequalities in service provision between regions, income groups, and urban/rural areas are found in all countries; see Carron and Chau).

The major difference between decentralized and centralized school systems lies with which level of government makes the resource allocation decisions resulting in unequal opportunities. In the centralized model unequal educational opportunities are the result of resource allocation decisions made in the ministry of education itself. In the decentralized model, unequal educational opportunities are usually the result of differences in wealth or tax base between the

local or regional governments responsible for financing elementary-secondary education; this is the case, for example, in Brazil. In the mixed model where the community often supplements central or regionally provided education with its own contributions, unequal opportunities are the result of both factors -- variations in tax base or income among communities and central government decisions to distribute resources unequally; this is the case, for example, in the secondary schools of Kenya.

Curriculum and Teaching Methods

As with school organization, curriculum standards are usually regulated and teacher education usually provided by the central government; in most countries, public school curriculum standards are, also, extended to private schools (e.g., Indonesia). Curriculum is typically viewed as being the domain of experts, who mainly reside in teacher colleges or the ministry of education. Teacher education is, also, typically viewed as the responsibility of the central government, or the regional government in large decentralized systems. In-service training, however, is usually somewhat more decentralized, with either a regional government or the regional directorate of the central ministry playing an important role in organization and delivery.

Centralization of curriculum decisionmaking need not imply a uniform curriculum. In Cameroon, the curriculum follows the French model and is highly specific and identical in all parts of the country. But other centralized countries have attempted to differentiate the curriculum to meet the instructional needs of different social groups. A tightly controlled pedagogy can be one policy response to the problem of poorly qualified teachers.

Centralization of curriculum decisionmaking also need not imply centralized production and distribution of textbooks. The ministry of education (or, in some federal systems, the regional secretariat of education) can produce and distribute textbooks to schools or school children. Or it can purchase and distribute textbooks. Or it can simply require students to purchase their own textbooks from either the ministry or local bookstores. In addition, the ministry can either specify the precise textbooks to accompany the curriculum, or it can give schools the freedom to select from an approved textbook list.

Examinations and Supervision

Perhaps the most crucial question regarding educational supervision is who selects the chief administra-

Table 1

Centralization-Decentralization Typology for Public Education

	<i>School Organization</i>	<i>Curriculum and Teaching Methods</i>	<i>Examinations and Supervision</i>
Centralized Model	Minimum schooling requirements and school organization (preschool, primary, secondary, vocational, higher education) set by the central government.	Curriculum, teaching materials, pre-service and in-service instruction provided by the central ministry of education.	Examinations set and evaluated, as well as teaching performance evaluated by central ministry of education; responsibility for direct supervision often lies with regional administrative offices.
Mixed Model	The central government determines organization of the schooling system, but the local community helps determine how many years of education are provided, often through at least temporary self-finance of years beyond those funded or authorized by the central government.	Curriculum, teaching materials, and in-service instruction established and provided by the central government or through its regional delegations.	Examinations are set centrally but usually administered and evaluated regionally; the instruction, often through regional or district offices.
Decentralized Model	Organization of schooling is almost always set by the central ministry of education; the local community decides how many years and levels of education will be provided.	The basic contents of the curriculum are set centrally, but textbooks may be selected and purchased locally, and in-service instruction may be provided locally or regionally depending on the size of the locale.	No national examination system exists; all examinations are set and evaluated locally; the central or regional governments usually provide limited supervision of teachers and schools.

tive officer of a school or group of schools and what power that individual has over the various educational functions. The chief administrator is typically appointed by the ministry (or the regional education secretariat) in a highly centralized system and may have relatively few powers other than sending personnel evaluations to the ministry and monitoring the education and examination system to assure compliance with ministry guidelines. On the other hand, in a decentralized system the chief administrator may be directly elected by the local community or may be

appointed by an elected mayor or council. Between these two extremes is the administrator who is appointed by the ministry and given considerable decisionmaking authority over resource allocation within the schools. In many countries, transportation is sufficiently difficult and human resources sufficiently scarce that, irrespective of how the administrator is selected, there is very little actual supervision of the schools. The fact that in many countries administrators are also responsible for supervising private schools only exacerbates this resource problem.

*Teacher Recruitment
and Compensation*

Central government sets accreditation standards, provides teacher education, sets teacher pay scales, and directly pays the teachers; in some cases (Francophone Africa) teacher recruitment, pay, and promotion may be under control of the civil service ministry rather than the ministry of education.

Teachers may be selected by the local school authority, but the central or regional government typically prescribes pay scales; accreditation standards are also set centrally.

Teachers are selected and pay scales are set by local government; accreditation standards are typically set by the central government but they may not be enforced.

*Finance of Recurrent
Expenditures*

All recurrent expenditures fully funded by central government excepting minor user fees; nonteacher resources distributed to schools.

The central or regional government provide most funding of local schools in the form of block grants or project grants, but some portion of educational expenditures are funded by local revenue sources, and the local community has some influence on total expenditure levels.

Local government funds elementary and sometimes secondary education from local revenue sources; user fees or "voluntary" contributions to the parents-teachers associations may be required; block grants or project grants may be provided by the central government.

*School Construction
and Finance*

Central government sets construction standards, which may be uniform for the entire country, and covers all construction costs, although the local community may be required to provide labor and/or some construction materials.

Construction standards are set by the central or regional government and matching funds are often provided for school construction; in some cases the matching funds take the form of a promise by the central government to cover some portions of recurrent expenditures, often teacher salaries.

Land and materials for school construction are provided by the local community; labor may be voluntary; local construction standards used.

Examinations provide a standard for measuring and evaluating learning. Variation in examination control and procedures is perhaps more extreme than any other educational function. In many former British colonies (e.g., countries in the West Indies) exams are set and graded in England. At the other extreme are most countries in Latin America which have no standardized national or other examinations; as a result, the criteria set for passing from one grade or one level to the next are set at the school level and vary greatly. In between these two extremes are countries which set

and grade exams nationally or regionally. Although a system of national examinations is typically found in the centralized model, Latin America demonstrates that local control of examinations and promotion standards can coexist in relatively centralized systems.

Teacher Recruitment and Compensation

Accreditation standards for teachers are almost always set centrally (a notable exception is the United States where state governments license teachers), but

the criteria set for accreditation are often ideal standards which cannot be met in practice. The local or regional labor market for teachers determines *de facto* local or regional accreditation standards, even in highly centralized school systems.

Teacher recruitment and promotion practices vary greatly between countries. In a highly centralized country like Cameroon the ministry of education doesn't even control recruitment and promotion. Instead the ministry of public service recruits, appoints, promotes, and moves teachers; nationally recruited teachers are also likely to enjoy civil service protection. In a decentralized country like Brazil, the community may itself recruit teachers, and employment and promotion may be in part politically determined (patronage of the elected mayor). Teacher compensation practices are highly correlated with recruitment procedures. When recruitment and promotion are centralized, there typically is a national pay scale, which does not vary with working conditions. When recruitment is decentralized, teachers are usually paid in accordance with local labor market conditions. One may also find (e.g., in Latin America) national pay scales and local recruitment of teachers. Furthermore, even in centralized systems with national pay scales, one may find local communities recruiting and setting teacher pay for additional grades beyond those provided by the central government.

Finance of Recurrent Expenditures

In a highly centralized educational system, the government both finances and directly provides all inputs with no local contribution (excepting minor matriculation fees). In a decentralized system, the local community finances and directly provides inputs, either through local tax revenues (e.g., Brazil) or through "voluntary" fees (e.g., Kenya). A mixed system would include central government finance and provision of some educational inputs (e.g., books, supervision) and grants (block and/or project) to regional or local government and some local community control over use of those funds (e.g., Colombia, India, Nigeria). An example of the latter is the Indian midday meal program which is provided by the local community but partly financed by central government grants. In general, the finance of government services is more decentralized in developing than industrialized countries. In an unpublished monograph, Bahl and Linnes find 15 percent of total government expenditures are financed at the local level in developing societies, compared with 32 percent in industrialized countries. In

addition, they found the relative importance of local government finance is larger in federalist countries and in large countries.

In addition to directly financing education, the central government also often exerts other kinds of financial control. Frequently, it performs an auditing function to assure voluntary or local contributions are used in accordance with regulations. This auditing and financial control often extends to private and community-based schools, where central governments often regulate user fees or development fees (e.g., Kenya).

School Construction and Finance

In the centralized model, the central government sets uniform construction standards and directly carries out all school construction. In the decentralized model, the local community finances (often through voluntary contributions) and constructs schools using local materials and construction standards. In the mixed model, the central government may construct schools using different regional standards, or the community constructing its own school may be required to follow government standards for the school to be accredited and staffed.

In practice, school construction and finance tends to be more decentralized than the other components of elementary-secondary education, especially in Africa and Asia. In many countries the central government offers an implicit matching grant, promising to staff the school constructed by the local community (e.g., Eastern Nigeria, Kenya, Zimbabwe, India).

Conclusions

In assessing whether an educational system is centralized or decentralized, it is necessary to look at the distribution of decisionmaking authority with respect to various educational functions. In doing so, one finds some educational functions (e.g., curriculum) tend to be controlled centrally, even in systems which in other respects appear decentralized. And, some educational functions (e.g., construction) tend to be provided locally, even in systems which in other respects appear centralized.

It is the combination of decisionmaking authority with respect to the various functions which determines whether the system can be characterized as centralized or decentralized. But the answers to three questions best discriminate between centralized and decentralized systems. Those questions are:

E Who selects the chief administrative officers of local schools, and what control do they have over resource allocation?

E Which level of government is responsible for recruiting and promoting teachers? Is there a national pay scale?

E What proportion of total expenditures is financed through local revenue sources, both tax revenues and voluntary contributions?

III. The Principles of Decentralization

The desirable level of centralization in education is that which maximizes social welfare. However, since there are no direct measures of social welfare, the question of the desired level of centralization must be answered using a variety of proxy criteria. The principle criteria employed here are: social efficiency, technical efficiency, and equity. But application of these criteria is a mere academic exercise unless the political and institutional contexts are considered as well. In what follows, the political and institutional constraints to either centralization or decentralization are first discussed. The initial conditions of the political and institutional contexts and their relationship to decentralization are summarized in Table 2.

As noted earlier, decentralization is an ambiguous term which includes a variety of governmental ar-

rangements for the finance and provision of public services. As typically used in elementary-secondary education, however, decentralization refers to devolution of decisionmaking authority to a subnational level, regional or local, of government. The most important constraints to devolution occur at the local level. As a result, it is devolution to the community or local government which is the focus of the analysis below.

Constraints on the Locus of Decisionmaking

Public Finance

Decentralization implies that the community or local government has decisionmaking authority with

Table 2

Initial Conditions for Decentralization

Initial Conditions Arrayed on Scale of Largest to Smallest Difficulty in Implementing Decentralization

<i>Government Finance</i>	<i>Political Context</i>	<i>Administrative Structure</i>	<i>Historical Context</i>
Direct central government provision of educational inputs to local schools.	Decentralization policy introduced by the central government, no consultation with affected groups, and associated with a particular politician or political party.	Constitution assigns responsibility for education to central government; lack of administrative capacity at local level.	Tradition of dependence by local communities on the central government.
Conditional cash grants for specific projects or functions.	Decentralization advocated by the central government with consultation with affected groups and with broad political support.	Central government administrative tasks already deconcentrated to the regional or local level.	Tradition of self-reliance by local communities and spirit of competition between communities.
Unconditional educational block grants or earmarked shares of central government tax revenues.	Pressure for decentralization originates at the local level and with affected groups, including parents, teachers, and local government officials.	Some educational decisionmaking given to local authorities, and local authorities permitted to raise some educational revenues.	
Large, local-government own-source revenues from taxes and voluntary cash and in-kind contributions.		Local authorities given significant decisionmaking responsibilities, resulting in development of local administrative capacity.	

respect to both the level and distribution of educational resources. These resources may be financed by transfers from the central government, own-source tax revenues, user fees, and voluntary association fees.

As noted earlier, the most common form of transfers from the central (or regional) government is payment of teacher salaries. In addition, central governments frequently provide grants to local or regional government for specific educational plans or projects. Both of these transfers are accompanied by regulations and restrictions that greatly limit the resource allocation authority of the local schools. Of course, to the extent such transfers are fungible, meaning the local government would have purchased the same inputs in the absence of the grants, they in fact provide a new source of unencumbered funds (albeit with administrative costs associated with preparing projects, disbursing funds, and monitoring and auditing use of funds).

Central government transfers to local governments can be constructed to give local governments substantial resource allocation authority while still fulfilling objectives of the central ministry of education. But in reality the grantor (the ministry) typically mistrusts the use of funds by local education authorities and, thus, attaches a number of conditions (such as projects) to the use of funds. The result can be, and frequently is, centralized resource allocation in a seemingly decentralized educational system.

Communities or local governments, of course, can often raise their own revenues, which can be allocated in accordance with local priorities. But the possibilities of raising substantial local revenues are often limited and sometimes prohibited by the country's constitution. The most common local government tax is the property tax which suffers from two major defects: (i) low revenue elasticity, which makes it a poor tax in a changing environment, and (ii) requirements for sophisticated tax administration, including cadastral surveys, objective assessments, and a professional, skilled administrative corps. The requirements for good property tax administration are typically unmet in developing countries.

Another means of providing own-source tax revenues is through a national tax on personal income, sales, employees, or some other measure of business activity, with some portion of the proceeds earmarked for automatic return to state or local governments. In Brazil, for example, a portion of a two percent payroll tax is automatically returned to state governments in proportion to revenues raised within the jurisdiction. Such automatic transfers of earmarked revenues avoid the administrative requirements of the property tax, and the tax itself may be more revenue elastic. On the

other hand, centrally administered taxes tend to have uniform tax rates, thereby limiting the revenue-raising authority of local jurisdictions. While it would be possible to devise centrally-administered taxes with variable rates, this is rarely if ever done.

Finally, communities can raise revenues for education through user fees, donated labor and materials, and voluntary or involuntary association fees. Quite clearly, some countries (e.g., Kenya, Indonesia) raise substantial revenues through these sources. But a variety of problems limit the use of user fees and voluntary association fees in most countries.

Often there are both legal and political constraints on user fees. The level of user fees imposed by the community or the local parent-teacher association (PTA) is usually limited and regulated by the central government due to the conflict such fees present with notions of "free education and equal access". Simply the reporting requirements for such fees may either limit their use or provide an incentive for local jurisdictions to not report their use (e.g., see Paul's discussion of Guyana). In other cases, schools are not permitted to keep the full revenues from the fees, thereby limiting incentives to impose fees. For example, in Indonesia schools can set fees, but all revenues accrue to the central government, which then redistributes the proceeds (Meesook).

If truly voluntary, association fees such as those for the PTA suffer from the usual free rider problem. In some African countries (e.g., Kenya, Anglophone Cameroon) such fees raise significant amounts of revenue only because they are in effect involuntary. On the other hand, contributions can come from a wide variety of sources and organizations, including parents, alumni, and local businesses. The variety of possible voluntary fees and other contributions are discussed elsewhere (Bray, 1985).

In addition to fees, communities can provide labor and materials for school construction, maintenance, etc. These in-kind contributions appear to be most successful when there is a definite target (e.g., constructing a school or competing with a neighboring community) but are less useful as a means of financing recurrent expenditures. A problem with relying on in-kind contributions of labor is that the opportunity cost of labor rises as per capita income increases. Thus, such contributions are less likely to be successful in urban areas than rural areas and are less likely to generate significant revenues in middle-income than low-income countries.

In sum, there are serious constraints on the ability of local governments or communities to raise revenues to support local schools. In some countries these constraints may pose an effective deterrent to the in-

roduction of decentralization measures which require local governments to raise revenues. However, for most countries, aside from legal constraints, local governments could, with technical assistance in tax administration, community organizing, etc., raise some revenues for local education.

Political Context

Both the political context and the administrative structure of a country may also pose constraints to decentralization. The political ideology and policy positions of key actors and interest groups in education play an important role in both the adoption and implementation of decentralization measures. As discussed later, lack of political support, not a shortage of technical expertise, most frequently is the cause of failed decentralization plans. The key political actors on the decentralization stage include functionaries in the ministry of education, teacher organizations, local government officials, local school administrators, parents, and parent-teacher associations.

Decentralization entails the redistribution of political power between different groups in society. While it may increase the power of local government at the expense of the central government, decentralization frequently strengthens the power of the central government (Conyers, 1984). In Chile, devolution of primary and secondary education to the municipalities occurred simultaneously with closer central government control over the municipalities with mayors appointed by the president and previously-elected community advisors being appointed by the mayor. In Mexico, delegation of teacher negotiation authority to representatives of the ministry of education in the thirty-one states appears to have had the underlying political goal of weakening the bargaining power of the union (McGinn and Street, 1986).

To be successful, decentralization plans must yield enough influential winners to more than offset the losers, and the plan must be constructed so as to prevent any one group of losers from blocking the entire plan. Since many interest groups tend to be risk averse, the mere uncertainty associated with the outcomes of decentralization is an important deterrent to change. The political constraint may not necessarily argue against attempting any form of decentralization, but it does prescribe care in attending to political concerns in assembling a decentralization plan. While the literature on implementation suggests some of the political problems which may arise, there is no positive theory of implementation to guide policymakers.

Government and Administrative Structure

Both the structure of government and administrative capacity can also serve as constraints to decentralization. Structure of government refers to constitutional and other legal constraints, including the existence of sub-national units of government, and whether chief administrative officers are appointed or elected, while administrative capacity refers to the ability to make and implement decisions; to collect revenues, budget, and keep government accounts; and to monitor and audit expenditures.

In most countries, the constitution determines the institutions of government, including the existence and powers of sub-national units of government. The constitution, or other legislation, assigns taxing and spending powers as well as governmental functions, including education, to different levels of government. If the constitution assigns most power to raise revenue and most education decisionmaking authority to the central government, decentralization may be difficult to legislate. The magnitude of the change required suggests new legislation may be forthcoming only in the case of national emergency or revolution (e.g., Chile).

The colonial administrative heritage of a country influences the writing of the constitution, citizen expectations, and administrative practice. Spanish colonial rule, for example, was hierarchical and centralized, characterized by paternalistic legislation regulating minutiae in the colonies. Regulations established ideal rules of conduct, even if those ideals were unrealistic. Little or no attention was paid to local conditions and regional differences in drafting and promulgating regulations.

The same pattern persists in most former Spanish colonies today, well over a century after independence. According to Hanson (1974), there tends to be hierarchical leadership in the ministry of education, and political allegiance is the principal criterion for appointment to important educational positions. The result is that educational decisions are largely made on the basis of political not educational grounds. The ministry still issues a comprehensive set of rules formulated for ideal conditions not found in the real world, with the requirement that children and schools conform to ideals, not generally allowing variation depending on local conditions. The result is a high degree of centralization, local officials visiting the central ministry to obtain favors much as in colonial times, and a local citizenry with no developed sense of autonomy and local control. Decentralization, which

requires a sense of local autonomy and control and reduced power at the ministry level, is difficult to implement given this administrative history.

One finds much the same administrative heritage in former French colonies. The French administrative system had very weak subnational units of government and highly centralized control. This heritage makes it difficult for ministries to give up control, and local communities tend to lack the requisite skills for managing themselves (Nellis has described how the intent to decentralize in Tunisia was frustrated by these factors).

The British colonies were, also, highly centralized as a means of exerting colonial control. But the British also introduced a tradition of fee-based and community-supported education, which was sometimes affiliated with religious missions. Included in this tradition was the important role of support groups like the PTA and Old Students or Old Boys alumni organizations. These support groups have tended to persist, even after the nationalization of schools by newly independent countries and even in socialist countries (e.g., Zagefka discusses their role in Burma). The tradition of user fees, voluntary associations, and local control facilitates the successful implementation of decentralization policies.

Administrative capacity at each level of government -- central, regional, local -- can also serve as an important constraint on decentralization. The capacities of local governments to tax, spend, and keep government accounts were discussed earlier with respect to public finance. Capacity at the local level is, also, required to administer a personnel system with some degree of civil service protection. In addition, in a system in which the central government transfers resources to lower levels of government, the central government requires the capacity to audit the use of funds and to prosecute corrupt practices, and auditing cannot occur in the absence of standardized accounting practices by the governments receiving the funds.

The administrative capacity of governments is also influenced by the education and training of decision-makers as well as the individuals who elect or appoint those decisionmakers. If local citizens are largely illiterate, they may not be able to make informed, rational choices in electing local leaders who advocate particular education policies. If local government administrators are poorly educated and have weak administrative skills, they may make poor educational policy decisions and lack the ability to carry them out or to appoint qualified administrators to do so.

In brief, the institutional structure and history of

government and the administrative capacity at various levels of government can act as serious constraints to decentralization. Effective decentralization may require constitutional change, changes in values, and training to improve administrative skills in some countries.

Historical and Cultural Context

The historical and cultural context also strongly influences the ability to decentralize. Some countries (e.g., Kenya, Nigeria) have a tradition of local community participation that extends beyond the colonial experience and facilitates attempts to decentralize education. Other countries have regarded decentralized education (especially the mission schools) as a colonial institution and have centralized and nationalized education upon independence. In still other countries, religion introduces values which either facilitate or deter decentralization. Islam, for example, values the diffusion of authority, which in countries like Pakistan is conducive to attempts to decentralize.

Social Efficiency

There are a number of administrative, political, historical, and cultural variables which influence how educational services are financed and delivered. These variables cannot be ignored in attempting to answer the rather academic question, what is the desired degree of centralization in education. But understanding that these variables can act as constraints on decentralization, one can still ask, if these conditions permit choice as to the organization of government, what is the desirable level of centralization. Are there economic grounds for advocating decentralization policies? Three economic criteria are used to answer this question: social efficiency, technical efficiency, and equity. The definition of these criteria and their implications for decentralization in education are summarized in Table 3.

Social efficiency refers to the use of society's resources to maximize social welfare. As used here, it is especially concerned with the match between the preferences of citizens regarding education and the educational services they receive.

Public Choice

The match between consumer-citizen preferences and public service provision is often studied under the rubric "public choice," which is the application of

market principles to the provision of government services. This match is presumed to be closer or better if the consumer-citizen in fact has choices. That is, if the consumer-citizen has the ability to elect local education leaders, decide how much to pay in taxes in order to receive a desired level of educational services, and has the freedom to move to another jurisdiction ("vote with the feet") offering a preferred combination of tax and service levels, social welfare is presumed to be higher. Public choice becomes private choice when citizens choose to send children to private schools, in which case they can directly select that school which offers the desired combination of user fees and educational services. Public choice is the economic argument for citizen participation in educational decisionmaking. In its pure form, this participation takes the form of citizens directly selecting educational leaders, educational taxes or fees, and educational service levels.

The consumer-citizen may be frustrated in effectively expressing preferences by a number of factors. First, citizens may be unable to either directly (voting) or indirectly (voting for a local, general government head who appoints the school chief) elect the local school administrator. Second, citizens may be constrained in their ability to raise local tax revenues, to set user fees or to impose involuntary association dues for the purposes of raising education revenues. If in a decentralized system citizens are unable to express preferences or intensity of preferences with respect to educational leadership, revenues and expenditures, the match between citizen tastes and educational services provided may not be any closer than that in some centralized systems.

A third factor limiting the expression of preferences is the inability of citizens to move from one jurisdiction to another to find the desired combination of taxes and educational services. If jurisdictions are large, citizens are less likely to be able to make such moves than if jurisdictions are small. And if local jurisdictions are not allowed by the central or regional government to vary their tax rates and/or educational expenditures, "voting with the feet" is of little consequence.

A fourth factor which limits the expression of preferences is central government regulation. To the extent the central government attaches conditions to grants to the local government and to the extent it mandates the level and use of educational resources, the local consumer-citizen may be dissatisfied in the resulting quality and quantity of educational services.

Of course, local public choice needs to be tempered by other considerations, in particular externalities and economies of scale with respect to some educational

functions. It may not be appropriate for local voters, especially if poorly educated, to select the curriculum and set accreditation standards, but it is appropriate for them to exercise some choice over how their personal income is allocated between government and private goods and choice over how the government budget is divided between education and other services.

Externalities

Externalities refer to the division between who pays for services and who receives the benefits. Elementary-secondary education exhibits significant externalities in the form of benefits to society from having a literate, skilled, well-socialized population. One can conceive of a local community which all the children leave, perhaps due to lack of employment opportunities, when fully grown and educated. The parents of children in the community will receive private benefits as a result of their children being educated and the economic returns which accrue to that education. But others in the community may perceive themselves as receiving very few private benefits. On the other hand, all members of society, especially in the communities to which the children move, receive societal benefits resulting from the education of the children. In other words, other members of society receive benefits without having had to pay for them, i.e., an externality.

In a decentralized system, interjurisdictional spillovers of benefits such as those described above constitute externalities which tend to reduce the amount of educational services provided by the local community. If taxing and educational spending decisions are made by the local voters, they will ignore the externality and thus spend too little on education. Two solutions to the problem are possible. One is to nationalize education, such that all the externalities are internalized in making decisions about educational spending; this, of course, is not consistent with decentralization. Another solution is for the central government to provide matching grants to local jurisdictions to encourage them to increase their spending on elementary-secondary education to assure generation of the desirable level of social benefits. Of course, social benefits are not easily measured, and the desirable level of social benefits is not easily determined. How society values these external benefits can only be revealed through the process used to select national (or regional) leaders and the budgetary priorities they assign to education.

In addition to interjurisdictional spillovers, there are other external benefits associated with particular

Table 3
Economic Criteria for the Evaluation of Decentralization

<u>Criteria</u>	<u>Definition</u>	<u>Implications for Centralization/ Decentralization in Education</u>
<i>Social Efficiency</i>		
Public Choice	The match between consumer-citizen preferences and public service provision.	Local citizens should have an important voice in choosing the combination of taxes/fees and educational services in the community and should also, have some influence on the nature of educational services provided. Central government regulations, restrictions, and mandates may limit public choice, as may the local tax base and impediments to the citizen "voting with his feet".
Externalities	The discrepancy between who pays for services and who receives the benefits.	Interjurisdictional spillovers may result in insufficient educational spending in a decentralized system. The central government may need to institute a system of matching grants to assure a socially desired level of spending.
External Efficiency	The balance between labor skills provided by the educational system and labor market demand.	In a country with distinct urban/rural and regional labor markets there should be variation within the country in terms of school organization, curriculum and the quantity of schooling.
<i>Technical Efficiency</i>		
Internal Efficiency	Maximization of educational output for a given educational cost.	Internal efficiency is higher when prices of educational inputs are allowed to vary with local (urban/rural, regional) market conditions, and the educational input mix is adjusted for local prices. Economies of scale may argue for centralization of some educational functions. Administrative costs, including both administrative capacity and the time required to make decisions, also affect unit costs and, thus, internal efficiency.
Technological Change	An increase in the educational output possible from a given level of inputs.	Technological change and innovation in educational organization and service delivery is likely to be greater in a system which both permits and encourages educational diversity and competition.
<i>Equity</i>		
Horizontal Equity	Individuals in like circumstances are treated equally.	When some portion of school revenues are generated from local tax sources, variations in wealth of the local tax base may lead to horizontal inequity. The central government can reduce the size of the problem through grants in aid to local schools with the size of the per pupil grant varying inversely with the local tax base per capita.
Vertical Equity	Relative equality of educational opportunity.	Equality of educational opportunity may be measured by access to and quality of education. In centralized systems, inequality is the result of central government decisions regarding resource allocation; in decentralized systems inequality may result from variations in local tax base and citizen willingness to pay for education. In either case the central government may use grants-in-aid to reduce spending disparities and improve equality of opportunity.

educational functions which may argue for either centralized or decentralized decisionmaking. Standardized examinations and similar school organization and curriculum standards across communities or regions may, for example, facilitate inter-regional migration of human capital both for the purposes of employment and further schooling. The result may be better informed and more efficient labor markets.

External Efficiency

External efficiency is the match of labor skills with labor market demand. Most countries or even regions are large enough to encompass rural areas where agricultural activities predominate, urban areas with heavy concentrations of retail and office activities, and industrial areas occupied by manufacturing firms. Somewhat different labor skills are demanded in each of these geographic areas, which may argue for different education to better prepare students in the needed skills and to maximize the social returns to public investment in human capital. Different education may entail variation in school organization, curriculum, and the quantity of schooling provided.

External efficiency argues for variation with respect to school organization, curriculum and the quantity of schooling. Such variation could be provided through the centralized ministry of education, or it could come about as a result of decentralized decisionmaking. Experience suggests that centralization tends to lead to uniformity in school organization and curriculum but not uniformity with respect to quantity of schooling. Decentralized decisionmaking may be required to yield the desired variation consistent with external efficiency.

Technical Efficiency

In addition to social efficiency, the degree of centralization may affect technical efficiency. Technical efficiency is primarily concerned with efficient resource allocation within the educational system, or minimizing unit costs.

Internal Efficiency

The degree of centralization affects several aspects of resource allocation, or internal efficiency. First, internal efficiency requires adjusting input combinations consistent with prices in the locality of the school. Under centralization, this is unlikely to occur unless local representatives of the ministry are empowered to determine what prices they are willing to pay for services, materials and supplies. But in most

centralized systems, there are uniform, national pay scales for teachers, and many school inputs (e.g., textbooks, furniture, food for school meals) are purchased centrally and distributed to local schools.

Second, internal efficiency is affected by administrative costs and efficiency, including administrative overhead, management capability, and time required for decisionmaking. The argument is sometimes made that decentralized administration leads to the duplication of administrative functions in each of the local (or regional) jurisdictions and, thus, leads to increased administrative costs.

The argument of duplicated costs essentially concerns economies of scale. Some administrative functions -- teacher supervision, budget preparation, local planning -- are of necessity carried out in small scale at the local level, irrespective of the degree of centralization with respect to other educational functions. But other administrative or educational functions may exhibit sizeable economies of scale. These functions include: curriculum development, development of instructional materials, and setting and grading standardized examinations. Thus, there may be a cost argument for centralization of some educational functions.

The scarcity of management skills in developing countries can also argue for centralized administration, wherein a few, skilled and educated administrators make decisions for the entire school system. But, as noted above, it's difficult to avoid locating some administrative functions at the local level, even in a centralized school system; some decisionmaking requires knowledge of the local situation that a physically removed administrator cannot know well. Still, the lack of management skills argues for somewhat greater centralization in, say, setting examinations and supervising local schools. There is little evidence in general, that decentralization has served to improve public management (Rondinelli, Nellis and Cheena). Nor is there evidence to show that decentralization has increased local participation, at least in Latin America.

Centralization of decisionmaking has one unambiguous cost -- the time required for decisions to be made. Often even the most minor expenditure of funds or personnel action requires filling a form, sending it to the ministry (perhaps via an intermediary regional ministry representative), awaiting a response, perhaps sending another appeal prior to receiving the response, and perhaps receiving a response requesting more information or better justification for the request. Bureaucrats in the central ministry have incentives to be cautious in their actions but no incentives to quickly respond to requests from the field. In the

meantime, the lack of affirmative response, to even obvious requests, may have serious negative consequences for education. One possible response to this situation is to improve response time in the ministry, but the bureaucratic incentives are such that response time will always be slower than that found in a decentralized system.

Technical efficiency is also affected by the use of community resources. The community devotes resources, in both pecuniary and non-pecuniary forms, directly to the production of educational services and, also, to lobbying for additional education resources from funding sources. The argument is frequently made that if the local community is given more responsibility for funding education and selecting local education leaders, it is likely to increase direct participation in the schools. If this increased productive participation is accompanied by decreased (socially) nonproductive participation in lobbying for funds, the net result is an increase in educational services with no increase in cost. But if the increased participation comes at the expense of citizen time spent in other endeavors, including leisure, there is an opportunity cost to the increase in educational services.

There is little evidence on either the social or technical efficiency consequences of decentralization. There are no studies to determine the extent to which decentralization in fact alters the nature of education services offered and the degree to which beneficiaries of those services are more or less satisfied. With respect to technical efficiency, construction costs of locally-constructed schools tend to be lower than ministry-built schools due to the use of lower cost materials and lower costs associated with contract administration. On the other hand, there has been concern in Nigeria that the growth in the number of local governments, which are responsible for elementary education, may be increasing the costs of administrative overhead.

There is some evidence that locally-provided schooling may be of lower quality. The "harambee" schools of Kenya, for example, are of low quality, both in terms of inputs (teacher quality) and outputs; only 13 percent of "harambee" schools exceed minimum standards (grade 4 attainment levels) compared to 79 percent of central government schools. But evidence from Brazil is mixed, at least with respect to quality of inputs; expenditures per pupil are lower in municipal than state schools in the Northeast, but the opposite is true in some states in the South. In neither case (Brazil and Kenya) can low quality of education be attributed to decentralization; rather, the cause of low quality education appears to be the fact that locally-provided schooling appears to be most common in

rural and poor areas where the central and regional governments have failed to provide educational opportunities equal to those in urban and richer areas.

Technological Change

A nationalized educational system is a monopoly which, excepting a few private schools which usually serve either the very rich or the very poor, permits little or no competition. As noted earlier, even the competition from the private sector is often heavily regulated, including tuition charges. The results of monopoly in other industries are well known -- little incentive to innovate, excessively high costs, and insufficient production. A plausible hypothesis is that some of these same results are found in highly centralized educational systems. Another plausible hypothesis is that, other things held equal, decentralization may lead to greater competition between local school systems and, consequently, greater innovation and technological change, reflected in lower unit costs.

Equity

The principal objections to decentralization concern the consequences for both horizontal and vertical equity. A related equity concern, especially among school teachers, is unequal pay for equal work; decentralization to the local level implies variation in teacher pay scales, reflecting local labor market conditions. The only effective solution to this pay equity concern is a national pay scale, which in turn implies a high degree of centralization.

Horizontal Equity

The principle of horizontal equity refers to individuals in like circumstances being treated equally. Education which is locally financed may violate this principle; individuals of given income and wealth levels are treated differently depending on the tax base of the community in which they live. A community with a high tax base per school child needs to set a lower tax rate to yield a given amount of revenue per child than does a community with a lower tax base. If the tax base is property wealth, two individuals with the same wealth pay different tax bills depending on whether they live in the low or high tax base community.

Horizontal inequity can have negative effects on economic efficiency (Buchanan). All individuals have an incentive to live in the high tax base, low tax rate jurisdiction, but it is only those of high income who can respond to the incentive. The result is communi-

ties which tend to be segregated on the basis of income; either the rich or the poor live in a given community. If the high income individuals also have skills (e.g., medical) demanded by all members of society, the result of geographic segregation may be an oversupply of such skills to the wealthy community and an undersupply to the poor community.

Grants-in-aid can be used to solve or at least ameliorate the horizontal equity problem. The central government can distribute block grants, the per capita size of which is inversely related to the local tax base, and thereby effectively reduce any tax advantage to living in a wealthier community. Alternatively, the central government could specifically reduce the horizontal inequity for education by distributing grants to local schools, the per students size of which is inversely related to the local tax base per pupil. The foundation plan used in many states of the United States sets a minimum (foundation) desired level of educational spending and then eliminates any tax base advantage for spending up to that foundation level. Beyond the foundation level, communities may decide to tax and spend whatever they wish. Of course, if the foundation level is not set high enough, there are still powerful incentives to individuals to locate in communities with a high tax base.

Vertical Equity

Vertical equity in education refers to the relationship between educational expenditures and family, community, or regional income or wealth. Ignoring how education is financed, maximum vertical equity would entail all children receiving the same value of educational resources, measured either on a per year basis or on a lifetime basis. Measured on the basis of annual expenditures, large inequalities in educational spending currently exist in developing countries between urban and rural areas, between geographic regions, and between income groups, irrespective of the degree of centralization in decisionmaking. Measured on the basis of lifetime educational expenditures, these inequalities are much larger still.

A decentralized educational system in which communities (or regions) both raise revenues and make educational expenditures is likely to yield significant inequalities in educational spending if only due to differences in tax base and income between communities.

The empirical evidence on the effects of decentralization, however, are ambiguous. In Chile, for example, municipalization was accompanied by altering central grants from a system that redistributed in favor of poorer regions to one which redistributes on a

per capita basis, thereby increasing inequities between rich and poor regions. And in Eastern Nigeria, wealthier communities were found to respond most strongly to government incentives for the construction of new schools. On the other hand, Knight and Sabot (1986) compared Kenya, which permitted a large expansion of secondary education via community supported harambee schools, and Tanzania, which did not permit such expansion by local communities and exercised strict quality controls. They concluded the Kenyan system provides greater equality of opportunity even though spending disparities are larger.

As noted above, the central government could largely remedy the vertical equity problem while still retaining the public choice advantages of the decentralized system. To reduce vertical inequity, the central government would need to either make unconditional block grants to offset differentials in tax bases of general local governments, or make per pupil education grants, the size of which is inversely related to the tax base per pupil. In the latter case, the central government would need to decide if it would offset tax base advantages for any level of educational spending or only offset tax base advantages up to some specified (foundation) level of spending.

The central government can also use project or other conditional grants for specific educational purposes to help offset tax base and spending differentials. But these grants tend to be administratively cumbersome, inefficient in accomplishing the educational objectives of the central government, and come accompanied by central government restrictions which limit local public choice (see Winkler's analysis of intergovernmental education transfers in Brazil).

Central governments in decentralized systems have sometimes attempted to ameliorate educational inequities. In Brazil, the formula for distributing federal elementary-secondary education monies to the states is highly redistributive and not strongly influenced by political considerations (World Bank, 1986). Both Eastern Nigeria and Kenya took actions to redistribute government grants in favor of lower income community schools. On the other hand, both Chile and Zimbabwe allocate government grants on a per capita basis with no consideration of community fiscal capacity. And Tilak (1986) found no relationship between federal education grants to provinces in India and measures of income levels or educational needs and concluded that grants are primarily allocated on political grounds and only serve to exacerbate spending disparities. Finally, a study of OECD countries found no relationship between forms of government (unitary vs. federal) and governmental efforts to bring about greater educational equality (Noah and Sherman).

IV. Role of the Central Government in a Decentralized System

If political, institutional, and administrative conditions permit a decentralized educational system to operate, that system leads to both improvements and problems in social efficiency, technical efficiency, and equity. The net result depends very much on the circumstances of the particular country, but government can do much to reduce the magnitude of the problems resulting from decentralization without at the same time eliminating its positive features. In particular, government can respond to the problems of decentralization by (i) nationalizing and centralizing elementary-secondary education, (ii) regulating decentralized education, or (iii) establishing incentives for local (or regional) governments to act consistent with central government objectives and social welfare. In all cases, the ultimate decisionmaker is the central government, yet there are significant differences between these three options in terms of the amount of decisionmaking authority given to regional or local authorities.

Problems of Decentralized Educational Systems

There are several reasons to argue for a strong central government role in elementary-secondary education. First, education yields social benefits, which will be underproduced in a completely decentralized system. Second, communities and their leaders may lack the information to select competent teachers and design curriculum and organize schooling; a completely decentralized system may result in inefficient resource allocation. Third, employers and advanced educational institutions may lack the information to evaluate the educational attainment of elementary-secondary school graduates; a completely decentralized system may result in uncertainty regarding the level and type of knowledge acquired by students and may impose additional screening costs on employers. Fourth, there may be horizontal and vertical inequity in educational finance and expenditure; in a decentralized system horizontal inequity may result in an inefficient distribution of specialized skills, and vertical inequity may conflict with societal norms of economic justice.

The question is not whether the central government (or in some cases the regional government) should exercise a strong role in elementary-secondary education but, rather, what should be the nature of that

role. Centralized control and provision of all educational functions may solve some of the problems noted above but at a possibly large cost in social efficiency (mismatch between citizen-consumer preferences and public educational services and a possible mismatch between skills produced and local labor market demand) and technical efficiency (excessively high unit costs and lack of innovation or technological change).

The central government can correct the problems of decentralized education without incurring the costs of social and technical inefficiency associated with centralized finance and provision of all educational functions. To do so requires a combination of regulatory and incentive measures. The policy tools available to government and their application to these problems are summarized in Table 4.

Regulations and Incentives

The central government can improve information available to local decisionmakers, some of whom may be novices in education, by defining minimum standards of school organization, curriculum, teacher qualifications, and achievement levels. For the purposes of informed decisionmaking, these standards need only be defined, not regulated and enforced. The standards should be realistic, minimum standards, not ideal standards; the latter, if unattainable, may provide little useful guidance in decisionmaking. In addition, since parents selecting private schools face the same informational problem as community decisionmakers, these same informational standards should also apply to private schools.

The central government can also help inform the employers of educated youngsters and advanced institutions of learning regarding the level and extent of knowledge. This information is most directly provided through a national or regional system of standardized examinations or uniform criteria for grade promotion or school graduation. Failing the adoption of an examination system or uniform promotion criteria, there is an economic argument for central government regulation and enforcement of minimum standards of school organization and curriculum, in private as well as public schools.

The problem of interjurisdictional spillovers results in local governments, in aggregate, spending inadequate amounts on elementary-secondary education. The central government can respond to this problem

Table 4

Central Government Policies in a Decentralized System

<i>Policy Tool</i>	<i>Policy Goals</i>	<i>Example</i>
Information and Training	Improve local administrative capacity and technical expertise.	Define minimum expected standards of school organization, curriculum, teacher qualifications, and knowledge required for promotion. Train local administrators in personnel and fiscal administration.
Financial Incentives	Increase educational spending to compensate for benefit spillovers.	Provide a central government matching grant for local educational spending up to some desired level, beyond which marginal social benefits are presumed to fall rapidly.
Redistribution	Reduce horizontal and vertical inequities.	Provide central government per student grants to local schools, the value of which varies inversely with the local tax base per pupil (horizontal equity) or inversely with the level of local educational expenditures per pupil (vertical equity).
Regulations and Mandates	Realize positive external benefits from definition of educational standards.	Establish a regional or national system of standardized examinations for grade promotion or school graduation.
Nationalization	Realize economies of scale through centralization of some educational functions.	The central government assumes responsibility for developing the curriculum, teaching materials, and textbooks in some subjects; it might also develop a rational system of standardized examinations.

through either regulation or the establishment of incentives to spend more. Regulation typically takes the form of specifying and enforcing a minimum expenditure per pupil or specifying (as in Brazil) that local governments spend a given percentage of total revenues on education. Matching grants from the central government can be used to provide an incentive to the local government to increase spending, at least up to some minimum level of spending which assures the provision of basic educational services. Both regulation and incentive grants require local governments to employ a standardized accounting system and require the central government to undertake periodic audits of the use of funds.

Aside from the problem of underspending due to spillovers of educational benefits, there may be a general problem of underinvestment by a society in its human capital. If this is perceived to be the case by the central government, it may introduce either regulations or incentives to local governments to increase spending. Regulations may include those mentioned above, such as specifying minimum expenditure levels, minimum tax rates, or minimum user fee levels. In-

centives may include rewards for better tax administration and compliance, matching grants for revenues collected through user fees, or other forms of matching grants. (An example of a disincentive to user fees is found in Indonesia where all the revenue from secondary education user fees is transferred to the central government; parents thus have no incentive to raise user fees in order to improve local education).

Solving the problem of horizontal inequity requires reducing or eliminating the advantage associated with a higher per pupil tax base. This can only be done by the central government in effect redistributing tax revenues from high to low tax base jurisdictions. This redistribution can take several forms. The central government can use its general tax revenues to fund capitation grants for education, the amount of which is inversely related to the per pupil tax base. Or, the government can include per pupil tax base as a variable determining the magnitude of other kinds of cash transfers, including project and matching grants.

Alternatively, if local education tax revenues are primarily derived from a single tax source, the central government could establish a single schedule of tax

rates and revenue per pupil, administer that tax and collect revenues. Of course, given the single schedule, jurisdictions with a high tax base would in effect pay more in taxes than they would receive in revenues, while the opposite would be true for jurisdictions with a low tax base. This solution would effectively eliminate horizontal inequity while preserving the ability of local governments to decide which tax rate and corresponding educational expenditure level they prefer.

Reducing horizontal inequity also helps solve the problem of vertical inequity, but there can simultaneously be horizontal equity and large educational spending differences. Hence, the central government may wish to directly reduce vertical inequity. Possible solutions are to impose direct limits on expenditures per pupil (this is done, for example, in California), to limit tax rates for high tax base jurisdictions, to regulate and limit user fees (possibly including limits on fees and, thus, expenditures in private education), and to provide cash transfers to assure that all jurisdictions attain some minimum level of spending.

Efficiency versus Equity

Two basic problems confront central governments with respect to the finance and provision of elemen-

tary-secondary education. The first is the appropriate tradeoff between efficiency and equity. The second is what measures to use to attain the desired balance.

Social and technical efficiency require some degree of public choice regarding spending, taxing and resource allocation; stimulation of competition and innovation; and possibly incentives to increase educational taxes, user fees, and spending. Horizontal and vertical equity require limiting the degree of public choice and possibly limiting educational revenues and expenditures.

All countries use some combination of centralized control, including direct finance and provision, regulations, grants and other incentives to attain some desired combination of efficiency and equity. That desired combination is a social and political decision. The important question is not so much the selected combination but whether or not a country could not attain more of one without suffering less of the other. In many countries large inequities in educational spending exist in spite of a highly centralized educational system adopted in the name of equity. In some cases it may be possible to decentralize some educational functions, improve efficiency, and not worsen spending inequities.

V. The Consequences of Decentralization

Controlling for other factors, a policy of educational decentralization is expected to result in improved educational efficiency and worsened equity. Unfortunately, the experience of countries to date provides very little empirical evidence on the economic consequences of decentralization. And there is no predictive theory or model that enables us to make confident conclusions about the independent effects of decentralization.

One problem in assessing the effects of decentralization is defining what constitutes a policy. At one extreme, significant educational reform can take place in the absence of formally stated policies or comprehensive plans (see the McGinn, Schiefelbein, and Warwick analysis of major educational policy changes in the absence of plans in Chile and El Salvador). At the other extreme, grandiose policies are sometimes suddenly announced and just as quickly dropped. And between these extremes are the policies which are carefully formulated but only half-heartedly implemented. Simply the difficulty in defining decentralization policy presents an important *caveat* to drawing firm conclusions from actual country experience.

Aside from the question of what constitutes policy is the matter of the criteria to use to evaluate policy success. Policies can be evaluated in terms of stated government objectives, underlying political goals, or more objective educational and economic criteria. Of these three, stated government objectives are the least useful for evaluation purposes. Stated objectives are often vague and general. For example, the stated objectives for decentralization in Mexico are (according to Prawda):

- E improve educational development in the states;
- E make plans and solve problems where they occur;
- E improve the efficient and effective use of resources; and
- E increase the participation and responsibility of the community in education.

Notwithstanding the difficulties in defining policies and stating precise educational objectives, there is a large literature analyzing which factors appear to de-

termine success in implementing decentralization policies. These studies do not, in general, consider the educational (*including* efficiency and equity) impacts of decentralization. Rather, they consider which factors appear to determine success in changing the organization and distribution of decisionmaking power in education. These factors are summarized here. In addition, the question of implementation strategies is briefly discussed.

Factors Influencing Implementation

A variety of factors affect public policy implementation in developing countries, a number of which were discussed earlier as possible constraints to the optimal centralization or decentralization of education. These factors include the system of public finance, the political context, government and administrative structures, and the historical and cultural context. (see Cheema and Rondinelli, 1983, for an up-to-date survey of studies on the implementation of decentralization in developing nations).

Public Finance

A minimum requirement for deconcentration in education is the transfer of resources and resource allocation authority from the central ministry to its regional or local directorates. For devolution and the effective transfer of independent decisionmaking power local or regional authorities must have their own source of revenues. That source of revenues may be earmarked central government tax revenues (as in Brazil), user fees or involuntary contributions or own-source tax revenues. The regional education directorates in the unsuccessful Peruvian decentralization effort had no source of local revenues, nor did they have their own budgets. On the other hand, successful attempts at promoting local education in Africa have typically entailed communities making liberal use of user fees and involuntary association cash and non-cash contributions.

Political Context

Political and organizational support are critical determinants of policy implementation. Decentralization alters the distribution of power and leads to natural conflicts between educators and parents and between

ministry and local officials. Three interest groups are especially important: teachers, ministry officials, and local officials.

Teachers play a critical role in implementing any decentralization plan, and a failure to include them in policy formulation can doom efforts at decentralization. They were ignored in the Peruvian decentralization effort and subsequently used the newly created community organizations to oppose the government (McGinn and Street, 1986). Ministry officials have the most to lose in decentralization, and active resistance by factions within the ministry represent a major threat to implementing decentralization. In constructing an implementation strategy, it is important that key ministry officials have an incentive to see the program succeed.

In addition, to political support by important interest groups, political continuity at the national level is required. Venezuela, for example, experienced several changes in political administration in the 1970s, although there was consistent support for a policy of deconcentration to regional and local directorates. Decentralization plans were announced with every change in administration in 1969, 1974, 1977, and 1979. Support for decentralization was consistent and financial resources were abundant, but every new minister of education announced a revision of the previous decentralization plan. As a result, decentralization was never implemented (Hansen).

Political instability in Venezuela took the form of frequent changes in ministers within a democratically elected government. In other countries political instability takes the form of frequent changes from authoritarian military regimes with a need for centralized control to popular democracy and the mandate to return power to the people.

Frequent political and policy changes often destroy fragile local government and community organizations; it is in general far easier to centralize than to decentralize. An example of how policies change is Pakistan, which gained independence in 1947 with elementary education provided by private schools and local schools run by district councils and municipal governments. Education was centralized to the provincial level in 1962, and in 1972 all private schools were nationalized. In 1979, the government again legalized private schools.

Government and Administrative Structures

Successful implementation of decentralization requires precise and concise laws and regulations governing the effort, effective and frequent communica-

tion between the center and the decentralized units, and incentives for administrators to implement the new policies.

Specificity of laws and regulations are important. If the descriptions of new roles, activities and coordinating activities under decentralization are unclear, there may be little effort to alter actions. Vagueness in implementation plans and directives permit an organization to claim existing activities meet those directives (Montjoy and O'Toole, 1979). In the case of Peru, the regional and local directorates created by the decentralization plan suffered from ambiguity as to their role. The ministry of education used them as its administrative arms. They were never given the opportunity to fulfill decentralization objectives because they were always responding to ministry requests for more plans and data. Drawing from the experiences of successful countries, Bray (1985) specifies the kinds of details required for successful introduction of community schools.

Historical and Cultural Context

Culture refers to the traditional role of communities and citizens' attitudes towards authority. According to observers, decentralization was relatively successful in Eastern Nigeria, in part due to a tradition of community competition (Okoye, 1986). This native tradition was further fostered by the colonial practice of communities constructing and paying the recurrent costs of mission schools. Another positive feature is that communities are small and blood-related, making it easier to control the free-rider problem common to the provision of collective goods (Igwe). Success in Eastern Nigeria can be contrasted to the failure of Peruvian education decentralization. One of the factors contributing to lack of success in Peru was a political culture highly deferential to authority and center-based decisions (Stromquist, 1986).

Culture also has much to do with the origins of decentralization policies in the first place. In Kenya, for example, the pressure for decentralization originated with the community, not the central government. When decentralization policies come from the bottom-up rather than the top-down there are higher expectations for participation and stronger pressures for implementation (Conyers, 1983).

Implementation Strategies

Implementation of decentralization policies requires a plan of action. Rondinelli (1986) notes at least four important elements to a successful strategy:

(i) concentrate initial efforts on small scale activities for which there is popular support and recognized need; (ii) gradually expand the scope of decentralized activities as local managerial and financial capacity increase; (iii) alter the mission of the central government ministry to support and facilitate the decentralized units, as opposed to direct provision and control; and (iv) train both local and central government administrators and officials to change attitudes as well as improve the skills required in a decentralized environment.

The United States' Experience

Elementary and secondary education in the United States are usually viewed as being highly decentralized, with local government, usually special school districts, raising revenues and providing education. The federal government plays only a very minor role in elementary-secondary education, although state governments have assumed an increasingly active role in regulating and financing education provided at the local level.

Some urban school districts, however, are very large with enrollments as large as some countries and encompassing a large number of ethnic and income groups. These large districts are effectively run by professional staff and the teachers' union with little opportunity for parental participation. (See Clark's description of this situation.) Frustration was so high that a movement arose to create independent community schools, not unlike the "harambee" schools of Kenya. Largely in response to minority group pres-

sure, an attempt was made in several cities in the late 1960s and early 1970s to decentralize and give community groups more say in operation of neighborhood schools. One city -- New York -- even permitted neighborhoods to elect local school boards to formalize community participation.

The dynamics of decentralization efforts in the United States were not unlike those in developing nations today. Most announced efforts at decentralization were attempts at administrative decentralization with no provision for parental participation (see Fantini and Gitell, 1973). Major opposition to decentralization came from those groups most at risk in losing power -- school teachers and administrators. In other words, much like decentralization efforts in other countries, the United States experience relied upon the opponents of decentralization to implement it.

The effects of decentralization efforts in the United States were neither large nor permanent, in part a result of insufficient funding. Creation of smaller decisionmaking units did not necessarily increase citizen involvement in education, although different citizens (community activists) did become involved (La Noue and Smith, 1973). The reforms appeared to bring about some minor curriculum changes, but no empirical evidence exists on the impact on student achievement.

In short, decentralization in United States cities experienced many of the same implementation problems as decentralization efforts in developing countries. And the evidence as to the empirical effects of decentralization efforts is no better for the U.S. than the developing countries.

VI. Research Agenda

In theory, decentralization has the potential to improve both the finance and efficiency of public education, as well as the potential to worsen equity. In reality, we know very little about the effects of decentralization on efficiency and equity. A number of case studies exist describing why decentralization policies were formulated, how they were implemented, why implementation was successful or not, and which interest groups appeared to win or lose as a result. These studies permit some generalizations about the politics of decentralization but permit almost none about the educational or economic consequences. Given the lack of generalizable results and the lack of a predictive model of the effects of decentralization, advocacy or opposition to decentralization must be based on either theoretical or political grounds.

As a policy, decentralization is faddish. It was initially advocated in developing countries in the 1950s as a means of establishing and reforming local government. With the sudden popularity of national planning in the 1960s, attention became focused on improving planning and administration at the center. When it was discovered that national planning could not in and of itself solve persistent educational problems, attention in the 1980s once again became focused on decentralization.

What We Need to Know

Before decentralization can be endorsed (or opposed) as good public policy, there is much that needs to be learned from existing decentralized systems and past attempts at decentralization. In addition, it may be necessary to undertake small scale experiments in decentralization in order to answer some of the more important questions regarding effects. The most important questions to which answers are needed are given below.

1. What is the impact of decentralization on social efficiency?

In theory, decentralization should lead to an improved match between consumer-citizen preferences and the quality and quantity of educational services provided. But the magnitude of this improvement is unknown, as is how the magnitude may vary with the type of decentralization undertaken.

2. How does decentralization affect technical efficiency and costs?

Decentralization should, in theory, also result in improved technical efficiency and lower unit costs for a given quality of education. But under which types of decentralization and which types of institutional arrangements does this in fact occur? Are total administrative costs higher or lower in decentralized systems? Are community resources more or less effectively used in decentralized systems?

3. What is the relationship between decentralization, competition between communities, and innovation?

Decentralization should, also, lead to greater competition between communities and greater innovation in the delivery of educational services. To what extent does this occur? How can competition and innovation be fostered in a decentralized system? What is the evidence from the decentralized systems that currently exist?

4. Under which conditions does decentralization lead to increased community finance and increased per pupil educational spending?

From the perspective of governments faced with expenditures growing more rapidly than revenues, the prospect of shifting finance of education to local communities is attractive indeed. Which conditions are required for communities to take the initiative in raising educational revenues? How can the central government facilitate such action by communities? Does the shifting of financing responsibility from central to regional or local governments lead to higher or lower spending per pupil? None of these questions have been answered, although careful study of decentralization experiments might yield some tentative answers.

5. To what extent are intergovernmental transfers consistent with decentralized decisionmaking?

Most countries decentralize educational finance through the use of intergovernmental grants to re-

gional and/or local governments. Most commonly, these grants are conditional on required actions or performance by the recipient of the grant, but this conditionality itself limits decisionmaking independence. How can grants be organized to transfer resources while maintaining decisionmaking independence by the grantee? Under what conditions would such unconditional grants be politically acceptable?

6. How does decentralization affect horizontal and vertical equity?

Decentralization is predicted to increase horizontal and vertical inequity. To what extent has this proven true in decentralization programs? Are inequities larger in decentralized or federalized developing countries than in centralized or unitary governments? What has been the impact of redistributive central government grants on spending inequities between regions or communities?

7. Can the virtues of decentralization be attained in a centralized system?

Decentralization in the form of devolution is predicted to have a number of positive effects on educational efficiency, finance, and management. To what extent can these advantages be attained in a centralized system? In other words, to what extent does decentralization of decisionmaking have to occur in order to realize significant efficiency gains? Which

educational functions should be centralized or decentralized in order to yield gains in efficiency and management?

Research Design

At least four basic research designs could be devised to answer the above questions. The first is to simply monitor and evaluate ongoing or past decentralization efforts, focusing on the above questions. Existing studies of decentralization cases have not focused on these questions and rarely provide empirical conclusions. The second is to undertake a systematic comparative study of centralized and decentralized educational systems, again with an emphasis on the collection of data aimed at answering the above questions. The third is to monitor (and possibly fund small scale) new decentralization efforts. Finally, the centralization or decentralization of particular educational functions could be studied. For example, a study to examine the determinants of local community financial support of education might be undertaken either across communities within a particular country or across countries demonstrating large variance in financial support.

Specific research designs could be developed to attempt to answer each of the questions posed above. Clearly, the appropriate design would depend on the country or countries being studied, their institutions, and the type of decentralization undertaken.

References

- Ayot, H.O., and K. Lillis, "Community Financing of Schools: Issues from Kenya," paper prepared for the workshop on *Community Financing of Schools*, Gaborone, Botswana, June 1985.
- Bahl, Roy, Jerry Miner, and Larry Schroeder, "Mobilizing Local Resources in Developing Countries," *Public Administration and Development*, Vol. 4, 1984, pp. 215-230.
- Bahl, Roy, and S. Nath, "Public Expenditure Decentralization in Developing Countries," *Environment and Planning: Government and Policy*, Vol. 4, 1986, pp. 405-418.
- Bray, Mark, *Educational Planning in a Decentralised System: The Papua New Guinean Experience*. Sydney: Sydney University Press, 1984.
- Bray, Mark, "A Resource Book on Community Financing for Governments and Voluntary Agencies." Paper delivered at the Botswana conference on *Community Financing of Schools*, June 1985.
- Breton, Albert, "A Theory of Government Grants," *Canadian Journal of Economics and Political Science*, May 1965, pp. 175-187.
- Buchanan, James M., "Federalism and Fiscal Equity," *American Economic Review*, September 1950.
- Beyna, Larry, et. al., *Managing Decentralization: An Annotated Bibliography*. Syracuse: Maxwell School, Syracuse University, 1977.
- Carron, Gabriel, and Ta Ngoc Chau, *Regional Disparities in Educational Development: A Controversial Issue*. Paris: UNESCO/International Institute for Educational Planning, 1980.
- Cheema, G. Shabbir and Dennis A. Rondinelli (eds.), *Decentralization and Development: Policy Implementation in Developing Countries*. Beverly Hills: Sage, 1983.
- Clark, Kenneth, *Powerlessness in the Ghetto*. New York: Prager, 1978.
- Conyers, D., "Decentralization: The Latest Fashion in Development Administration?" *Public Administration and Development*, Vol. 3, 1983, pp. 97-109.
- Conyers, D., "Decentralization and Development: A Review of the Literature," *Public Administration and Development*, 4, 1984, pp. 187-197.
- Fantini, Mario and Marilyn Gittell, *Decentralization: Achieving Reform*. New York: Praeger Publishers, 1973.
- Gomez-Buendia, Hernando and Rodrigo Losada-Lora, *Organizacion y Conflicto: La Educacion Primaria Oficial en Colombia*. Bogota: Centro Internacional de Investigaciones para el Desarrollo, 1984.
- Guthrie, James, *School Finance Policies and Practices*. Cambridge: Ballinger Publishing, 1980.
- Hansen, E. Mark, "Administrative Reform in the Venezuelan Ministry of Education: A Case Analysis of the 1970s," *International Review of Education*, xxx (1984), pp. 119-140.
- Hanson, Mark, "Organizational Bureaucracy in Latin America and the Legacy of Spanish Colonialism," *Journal of Interamerican Studies and World Affairs*, Vol. 16, No. 2 (May 1974), pp. 199-219.
- Hinchliffe, Keith, "Federal Finance, Fiscal Imbalance, and Educational Inequality," The World Bank, Education & Training Series Discussion Paper No. EDT 72, 1987.
- Hurst, Paul, "Decentralization: Panacea or Red Herring?" in Lauglo, Jon, et. al., *The Control of Education*, pp. 79-85.
- Igwe, S. O., "Community Financing of Schools in Eastern Nigeria," paper prepared for the workshop on *Community Financing of Schools*, Gaborone, Botswana, June 1985.
- Jimenez, Emmanuel and Jee-Peng Tan, "Educational Development in Pakistan: The Role of User Charges and Private Education," The World Bank, Education and Training Series Discussion Paper No. EDT 16, 1985.
- Jimenez, Emmanuel and Jee-Peng Tan, "Decentralized and Private Education: The Case of Pakistan,"

Rondinelli, Dennis A., John R. Nellis, and G. Shabbir Cheema, *Decentralization in Developing Countries: A Review of Recent Experience*. World Bank Staff Working Paper No. 581. Washington, D.C.: World Bank, 1984.

Saqeb, G.N., "The Effects of Tensions Between Nationalism and Provincialism on Educational Administration in Pakistan" in J. Lauglo, et.al., *The Control of Education*, pp. 33-44.

Schoefthaler, Traugott, "Propositions for Revitalizing Research on Educational Decentralization," paper presented at International Institute for Educational Planning, Paris, December 1985.

Smith, B., "The Measurement of Decentralization," *International Review of Administrative Sciences*, Vol. 15, 1979, pp. 213-222.

Stephens, David, "Decentralization of Education in Northern Nigeria" in Lauglo, et.al., *The Control of Education*, pp. 159-168.

Stromquist, Nelly P., "Decentralizing Educational Decision-Making in Peru: Intentions and Realities," *International Journal of Educational Development*, Vol. 6, No. 1, 1986, pp. 47-60.

Tilak, Jandhyala B.G., "Centre-State Relations in Financing Education in India." New Delhi: National Institute of Educational Planning and Administration, 1984.

Tilak, Jandhyala B.G., "Public Financing of Education in a Federal State: The Case of India." New Delhi: National Institute of Educational Planning and Ad-

ministration, 1986.

United Nations, *Decentralization for National and Local Development*. New York: United Nations Department of Economic and Social Affairs, Division for Public Administration, Technical Assistance Program, 1982.

Veeraraghavan, J., "India: Mechanism for the Allocation of Resources to Education from the Federation to the States." Paris: IIEP, UNESCO, 1982.

Vieira, P., *Toward a Theory of Decentralization: A Comparative View of Forty-Five Countries*. Ph.D. dissertation. School of Public Administration, University of Southern California, 1967.

Winkler, Donald R., "The Distribution of Educational Resources in Paraguay," *Comparative Education Review*, Vol. 24, No. 1 (February 1980), pp. 73-86.

Winkler, Donald R., "Fiscal Federalism and Primary Education Finance: Brazil and the United States," paper presented at the Universite de Dijon, June 1986.

World Bank, *World Bank Development Report 1983*. Washington, D.C.: 1983.

World Bank, *Brazil: Finance of Primary Education*. Washington, D.C.: The World Bank, 1986.

Zagefka Yannakopoulos, Polymnia, "Eleven Experiences in Innovations in Decentralization of Educational Administration and Management of Local Resources," mimeo. Paris: UNESCO, August 1980.

UNIT D

Module 15

Objective:

1. **The objective of this module is to present issues of implementing educational change in a developing country.**
2. **The module presents a framework which can be used as an heuristic planning model.**
3. **The module presents a framework for formative or summative evaluation.**

Unit D

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Introduction

This module presents a framework to analyze the implementation of educational innovations, programs and policies. The framework can be used: 1) as a tool for planning when designing an innovation, 2) as a tool for formative evaluation during implementation, or 3) as a basis for drawing conclusions about past efforts at implementing educational change. A case study of educational innovation in Pakistan is used to further illustrate salient issues from an implementation effort.

The Transactional Framework

Implementation is a process by which laws, executive orders, plans, proposed innovations, programs and policies are turned into action. Effective implementation requires transactions among policy proponents, critics, implementers, clients, and others whose support is necessary for action to happen. These transactions are necessary while the program is being planned, organized, carried out in the field, and changed in light of information about ongoing performance.

The transactional framework includes twelve aspects which are related to the implementation of educational innovations. An outline of those aspects is provided in Appendix A.

Aspects of the transactional framework will be briefly summarized here. A detailed presentation of the model can be found in the document, The Implementation of Educational Innovations in Pakistan: Cases and Concepts, by Warwick, Reimers and McGinn, available from the BRIDGES publications office.

1. Organizational Intelligence means the amount and quality of the information available to design and monitor the implementation of the innovation. Initial intelligence is needed during the analysis and planning that leads to the policy. Ongoing intelligence focuses on progress and problems during implementation.
2. Process refers to the participation of key figures in the design of the innovation.
3. Tasks and Technologies. Do implementors know what they are supposed to do to carry out the innovation and are the necessary technologies available? Ambiguity about what is to be done or a scarcity of the tools for carrying out an innovation, such as textbooks, can cripple field action.
4. Management and Organization. Innovations are most likely to be implemented if they can be integrated into the administrative structures of the organizations involved, if one agency or level has the responsibility and will to carry out the action, and if the changes do not stir rivalries among organizations.
5. Culture. An innovation stands the best chance of implementation when it seems to grow out of or be compatible with a region's culture.
6. Politics. Implementation is most likely when politics drives an innovation and does not breed inaction, hostilities, or bureaucratic battles.

7. Field Implementers. Do they have the knowledge necessary to carry out the tasks? Are they motivated to act in the ways desired? Does the innovation cause them personal, political, or social difficulties?
8. Clients. Are they interested in the innovation and willing to adopt it? The chances of implementation rise when clients see concrete benefits and few or no risks in adopting the change.
9. Facilities that will support the innovation are present. In educational innovations these include school buildings, transportation, residences, and teaching aids.
10. Costs. Is the innovation cost-effective in the eyes of funders? Are there enough financial resources to carry it out?
11. Quantity and Quality of Services. Does the innovation provide enough services to meet client demand? Is the quality of the services high enough to meet client standards and those of potential opponents?
12. Institutionalization of Change. Can the innovation be sustained and integrated into regular routines and organizations once the initial drive that launched the effort fades away?

The Implementation of the Teaching Kit

The information on which this case was written comes from 100 interviews with education officials at the Federal and Provincial level in Pakistan and from a sample survey of 487 schools. It is also based on interviews with over 900 teachers at those schools.

In 1974 the Ministry of Education of Pakistan, following a recommendation from UNESCO, decided to give each school a Teaching Kit. The objective was to make it easier to learn abstract concepts from concrete examples and move away from rote learning. The Teaching Kit is a box with 100 items such as charts, maps, chemicals, test tubes, beakers, a magnet, posters of famous personalities in the history of Pakistan.

After some pilot testing of the items the project began in 1976 with funding from UNICEF. The government asked the National Education Equipment Center in Lahore to produce the 60,000 kits needed.

Most officials interviewed by BRIDGES gave this innovation mixed reviews. They claimed the kits were being used in few classrooms and that some school officials did not know what they were. The BRIDGES survey of schools confirmed these perceptions (see Figure 1 below).

Survey findings show that only 60% of the schools had a Teaching Kit. Distribution of the kits was a particular problem in the province of Balochistan where travelling is difficult; in that province only 27% of the schools had a Teaching Kit.

Of the 900 teachers in the sample, 64% were in schools with a Teaching Kit. Of those with access to a kit, only 56% have used it. Hence, of all the teachers in the sample, only 36% have access to a kit and have used it.

Among those who use a kit in teaching, the average number of lessons per year in which it is actually applied is 8. There are many reasons for this low frequency. These include the lack of training given to teachers on how to use the kit, the clash between this technology and the emphasis on rote memorization in the classroom, and the teachers' fears of having to use their own money to replace broken parts (see Figure 2 below).

Before asking about the Teaching Kit, we asked teachers whether they had materials, other than blackboard and chalk, to help them teach. Of the teachers with access to a Teaching Kit, 43% replied "no" to this question. Teachers apparently did not see the Teaching Kit as one of the standard aids available to them in the classroom.

The survey of teachers suggests that there are problems in using the kit in the schools. Of those who have access to a kit:

- 11% say that the kit is not in the school.
- 33% say the manuals are not in the kit.
- 22% say the kit has all of its parts.
- Only 11% say the government repairs or replaces broken parts.

Figure 1

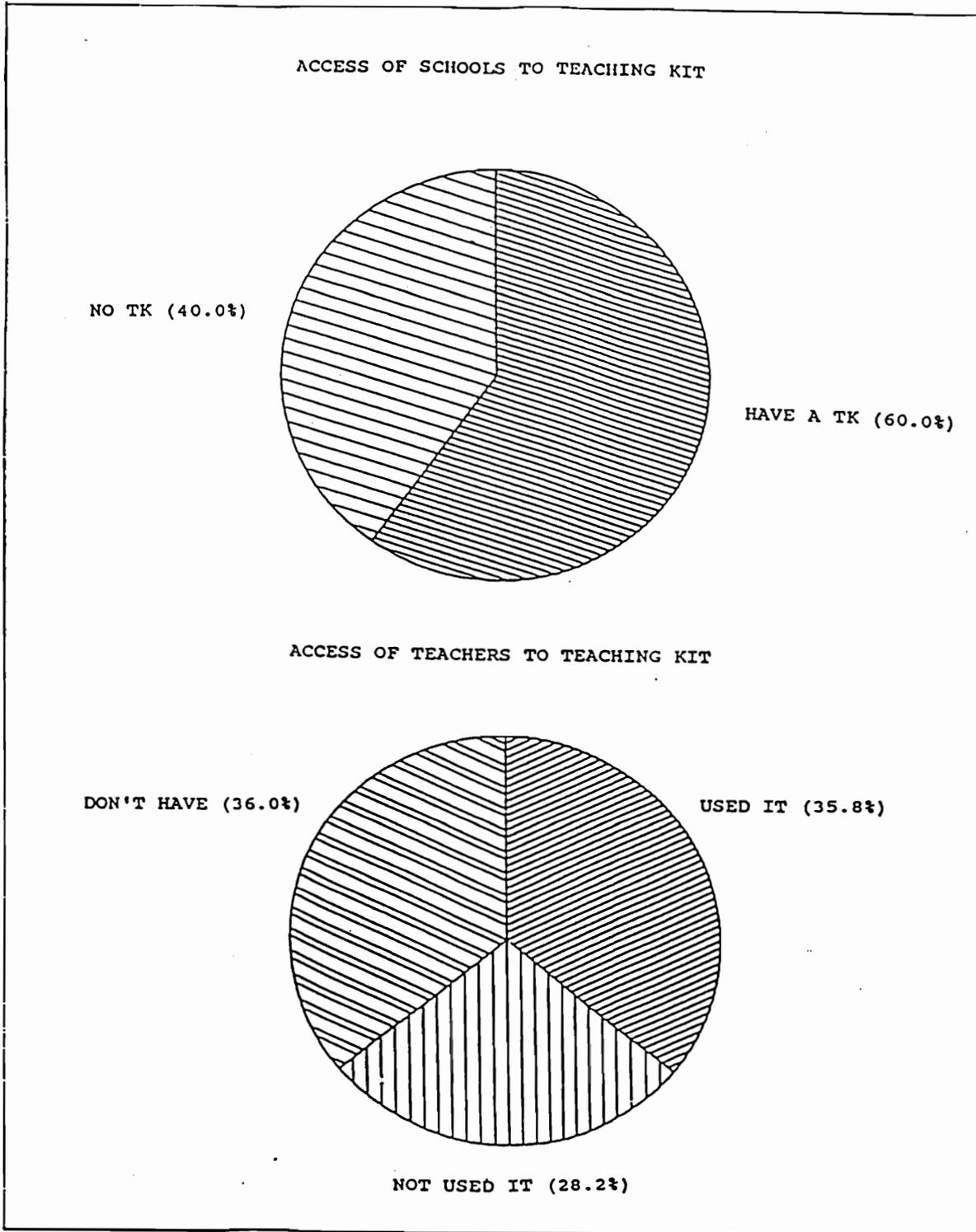
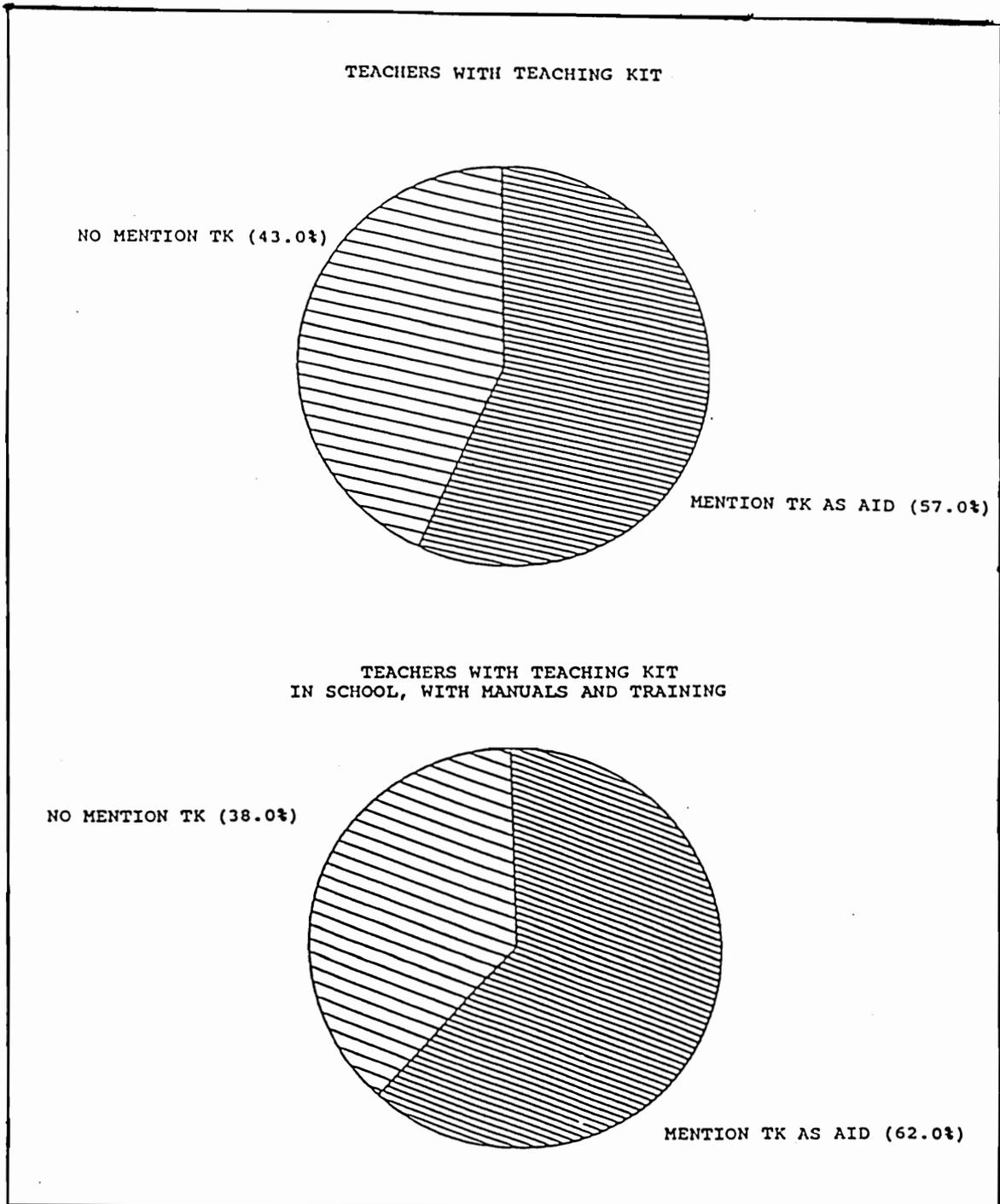


Figure 2



How can we explain the low use of the Teaching Kit? We examined the relationship between use of the kit and the:

- number of classes taught by the teacher
- number of subjects taught
- whether the school was urban or rural
- gender of the school
- province
- number of years of schooling of the teacher
- professional certification of the teacher

We found that none of these conditions was related to using the kit.

The best predictor of use of the teaching kit was **TRAINING** (see Figure 3 below). Of the teachers who had received training and had a kit available, 84% used it. Of those who had **NOT** been trained but had access to a kit, 48% used it.

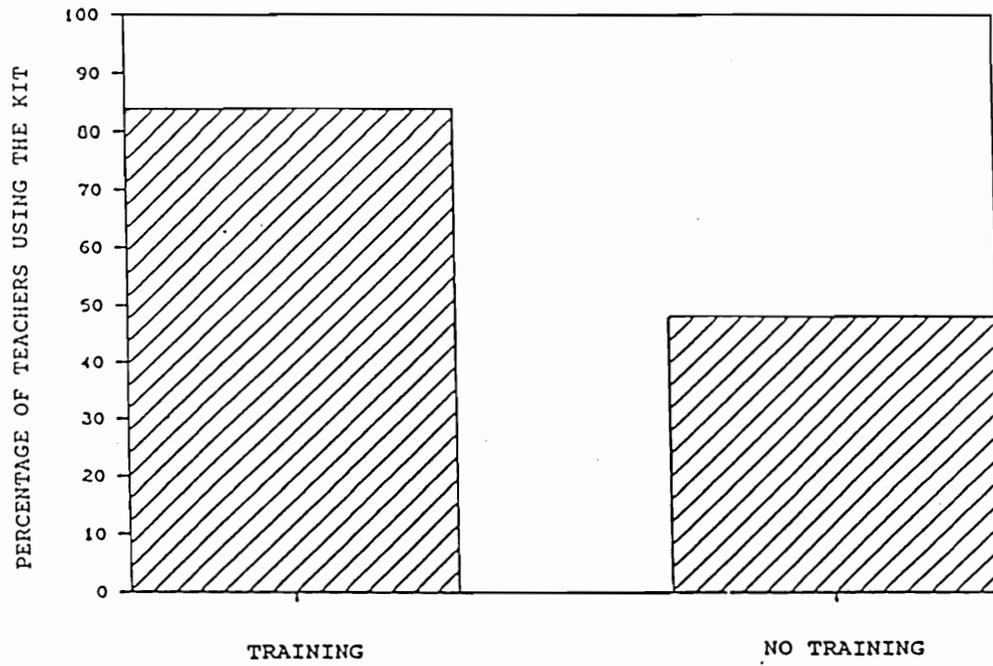
However, in the total sample, only 23% of the teachers in schools that had a Teaching Kit were trained to use the kit. These findings show a serious neglect of the implementers who would ultimately affect whether or not this innovation would be successful. Even among teachers who had a teaching kit in their school and who had been trained to use it, 38% said they had no other materials, aside from blackboard and chalk to help them teach.

These findings show that the Teaching Kit is physically present in about half of Pakistan's schools, and rarely used in 36% of them. The Teaching Kit is rarely cited as an innovation that has taken hold in the classroom.

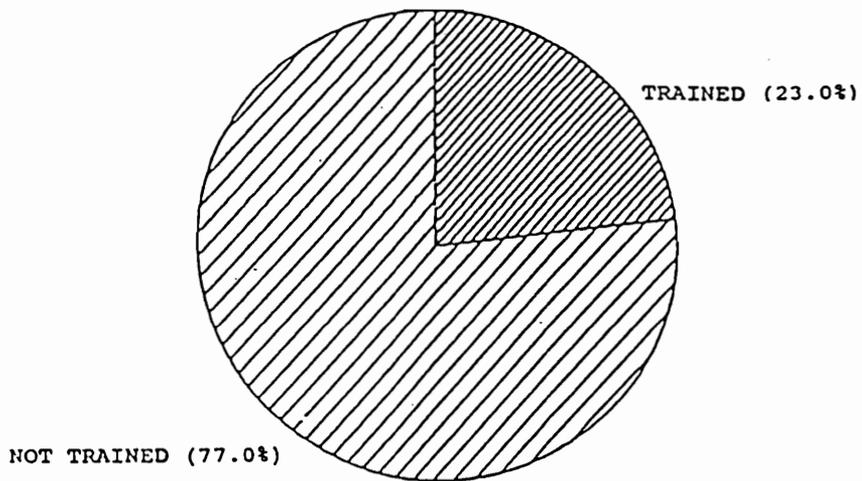
How can these findings be interpreted through the transactional model of implementation?

Figure 3

EFFECT OF TRAINING ON USE OF THE KIT



TEACHERS TRAINED TO USE THE TK



Organizational Intelligence

There was little initial or ongoing intelligence in the design and implementation of the Teaching Kit. A senior official who participated in the commission designing the kit told us,

"The commission was so focused on the teaching kit that nobody thought about the real problems: about the fact that more than half the schools did not have buildings, that DEOs [District Education Officers] are not good delivery mechanisms (I have visited the offices of DEOs and seen where they have stocks of furniture being eaten by termites, materials which are not delivered), but the committee was so focused on the kit that these issues were not considered."

Related to this was the limited participation in project design of those who would use the innovation. Designers were specialists in the bureau of curriculum focusing on teaching technologies. These curricular specialists did not consult those who would have to distribute and use the kits.

Distribution was indeed a problem as illustrated by the fact that overall 40% of the schools do not have one; and by the fact that in Balochistan, a province where travelling is difficult, only 27% of the schools had a Teaching Kit.

There were problems in moving the boxes of items from NEEC to the District Education Officers and from there to the schools. In July 1979, the Director of the National Educational Equipment Center wrote to the government of Punjab that 4337 kits for that province had not been claimed. By June 1980, only 5 of the 13 DEOs in Punjab had picked up their kits. Similar problems arose in other provinces. And even when they reached the District Offices, many kits stayed there for months or years. Items in the kits were stolen or suffered damage from rust and insects. DEOs and their assistants did not have the funds to take the kits to the schools and saw this task as onerous. The assumption of Ministry staff that district officials would follow orders to pick up and deliver the kits was often mistaken.

Implementation would have been helped by feedback about what was happening with Teaching Kits in the classrooms. Through ongoing evaluation, the program's managers might have used feedback to make improvements in areas such as the training of teachers.

Process

The chances of implementation rise when those who use an innovation feel some ownership in its development. That feeling was typically missing among the teachers and school heads who were given the kits. The kit's contents were developed by the central government with the help of UNICEF rather than by, or with, the potential users.

Tasks and Technologies

Implementers will be most likely to use an innovation when they understand it. With the Teaching Kits teachers needed a clear sense of what tasks they should perform, and how the items in the kit were related to those tasks. Training was particularly important with this innovation because the Teaching Kits implied a departure from traditional methods of rote learning. Yet, teachers often did not know what was to be done with the items in the kit. We have seen that only 56% of the teachers with access to a Teaching Kit used it. This dramatically illustrates the important effect of training (84% of those trained used it), but only 23% of the teachers with access to a kit were trained to use it.

A senior education official in the province of Balochistan told us:

"We got the 3300 teaching kits from UNICEF. We distributed those, but the teachers were not oriented to the teaching kit; we provided them boxes which were never opened . . . There was no supervision, no training provided on how to use the kits."

A senior official in Islamabad said:

"The teaching kits started in collaboration with UNICEF . . . a sham of training was arranged . . . the training of teachers was not good and it got diluted."

A District Education Officer said:

"Almost all the schools have kits . . . the teachers are not properly trained to use them. But then, neither are the supervisors, nor the Sub-District Education Officers or the District Education Officer trained! I visit the schools and have seen that the kits are not being used."

We have seen also that there was little supervision of the ongoing process of implementation, and in many schools the Teaching Kit never reached the teachers.

Field Implementers

Another category of the model which is especially relevant to explain the implementation history of the Teaching Kit is the Field Implementers. Given the way in which the Teaching Kits were developed, there was little demand for them among field staff. It was not designed to satisfy their needs but to promote concepts of educational change originating in UNICEF and the Ministry of Education. We have seen that among teachers with access to a Teaching Kit, 43% did not think of it immediately as a teaching aid.

Teachers also feared that if an item in the kit was lost, stolen or worn out, they would have to replace it.

A provincial secretary of education told us:

"There are a number of reasons why the teaching kits didn't work too well . . . Teachers were afraid that if they damaged the kit or lost an article they would be held responsible."

Another official said:

"Audit proves that when an item of the kit was missing the Head of the School was penalized. This affected the head's salary so he or she locked it up."

Supporting Facilities

Successful implementation requires also that the conditions in the environment are consistent with what must be done through the innovation. One difficulty with the Teaching Kit was that many schools either had no buildings or no space within the buildings for storing the material. A Ministry of Education official said:

"Our education system is poverty stricken. We have 29,000 shelterless schools. Sixteen thousand schools have only one room. Seventy percent of these impoverished schools have no place to keep the kit. One cannot expect teachers to carry the box back and forth from home to school every day. So if there is a place to keep the kit within the school vicinity, only then you can expect it to be used."

School staff complained that the Teaching Kit could not be used when classes were large. According to a Headmistress the kit does not work when there are more than 45 children in a class. "By the time the teacher makes the children bring out their books and the lesson is initiated it's time for the next class." Another headmistress felt that the atmosphere of village schools works against the use of Teaching Kits.

"There is no light, no fan. It is very depressing and dreary and suffocating . . . There is no toilet, no sweeper in any of the schools. When they need a latrine, the girls have to go home during school hours, wasting a considerable amount of time."

Some teachers also found that the Teaching Kits did not fit their teaching style, which emphasized lecturing and rote memory rather than illustrations and experimentation. Others said they were so exhausted by teaching that they had no time for anything new.

Conclusion

The Teaching Kit was an innovation driven more by technology than by the interest and the needs of teachers and school heads. Because it was developed by the Ministry of Education with aid from an international donor, it seemed to be a top-down experiment being force-fed into a system that was not ready for it. Provincial officials found it burdensome to implement, while teachers often did not know what it was or how it should be used. Fears about having to pay for missing parts, inadequate storage space, large class sizes, and difficult working conditions further dampened enthusiasm for the kit. This innovation did enjoy some degree of institutionalization. The kits were sent to the schools and are still found in about half of those studied. But if institutionalization means not only the physical presence of materials, but the ability and commitment of implementers to use them, the Teaching Kits fall far short of what the government and the international donor had originally expected. In reality, teachers rarely use them and their net impact on the quality of education seems slight.

A 12-ELEMENTS IMPLEMENTATION MODEL

1. ORGANIZATION INTELLIGENCE
INITIAL INTELLIGENCE
ONGOING INTELLIGENCE
2. PROCESS
PARTICIPATION, OWNERSHIP BY KEY FIGURES
INNOVATION ADAPTED TO LOCAL SETTING
3. TASKS AND TECHNOLOGY
CLEAR DEFINITION OF TASKS
TECHNOLOGIES AVAILABLE
TECHNOLOGIES REACH IMPLEMENTORS
4. MANAGEMENT AND ORGANIZATION
INNOVATION INTEGRATED INTO NORMAL ORGANIZATION
ADEQUATE SUPERVISION
COMPATIBLE RELATIONS AMONG ORGANIZATIONS INVOLVED
5. CULTURE CONTEXT
INNOVATION COMPATIBLE WITH RELIGION, CULTURE
6. POLITICAL CONTEXT
INITIAL GOVERNMENT COMMITMENT TO IMPLEMENT
INNOVATION SEEN AS POLITICALLY CLEAN, ACCEPTABLE
7. FILED IMPLEMENTERS
UNDERSTAND INNOVATION
CAPABLE OF CARRYING OUT INNOVATION
MOTIVATION TO USE INNOVATION
PERFORMANCE OF REQUIRED TASKS
8. CLIENTS
COOPERATION FROM PARENTS
COOPERATION FROM STUDENTS
9. SUPPORTING FACILITIES
PRESENCE OF ADEQUATE BUILDINGS
OTHER SUPPORTING CONDITIONS
10. COSTS
EFFICIENCY IN START-UP COSTS
FUNDS TO SUPPORT ONGOING ACTIVITIES
PERCEPTION THAT EXPENDITURES ARE WORTHWHILE, JUSTIFIED
11. QUANTITY AND QUALITY OF SERVICES
INCREASED ENROLLMENT
QUALITY OF SERVICES
12. INSTITUTIONALIZATION OF CHANGE

APPENDIX A

A 12-Element Implementation Model

1. **Organization Intelligence**
Initial intelligence
Ongoing intelligence
2. **Process**
Participation, ownership by key figures
Innovation adapted to local settings
3. **Tasks and Technology**
Clear definition of tasks
Technologies available
Technologies reach implementers
4. **Management and Organization**
Innovation integrated into normal organization
Adequate supervision
Compatible relations among organizations involved
5. **Cultural Context**
Innovation compatible with religion, culture
6. **Political Context**
Initial government commitment to implement
Innovation seen as politically clean, acceptable
7. **Filed Implementers**
Understand innovation
Capable of carrying out innovation
Motivation to use innovation
Performance of required tasks
8. **Clients**
Cooperation from parents
Cooperation from students
9. **Supporting Facilities**
Presence of adequate buildings
Other supporting conditions

10. **Costs**
 - Efficiency in start-up costs
 - Funds to support ongoing activities
 - Perception that expenditures are worthwhile, justified
11. **Quantity and Quality of Services**
 - Increased enrollment
 - Quality of services
12. **Institutionalization of Change**