EDUCATION POLICY ADJUSTMENT

Raising School Quality and Efficiency

An Invitational Conference
The World Bank and U.S. Agency for International Development

November 14-15, 1988
Washington, D.C.

Co-chaired by

Aklilu Habte
Office of the Vice President
Africa Region, World Bank

Gary Theisen
Office of Education
USAID

This conference was organized with assistance from the International Science and Technology Institute, Inc., particularly Martha Engel, Joan Claffey, and Rick Huntington. Irene Landwehr (World Bank) and Mary Lou Smale helped with many details. Thanks also to Dianne Terpeluk, Lisa Jobe, and Karen Fuller for arranging the conference venue.

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Reading Materials

PROGRAM AGENDA

Education Policy Adjustment: Improving Quality and Efficiency

A World Bank/USAID Conference

Monday, November 14

9:00 **Welcoming**
Co-chairs Aklilu Habte and Gary Theisen

Expectations for the Conference
Stephen Heyneman, World Bank
Charles Gladson, Agency for International Development

9:45 **Presentation 1** — Overview of Bank's Current Experience in Sector Lending
Wadi Haddad and Michael Wilson, World Bank

10:15 **Roundtable discussion**

10:30 **Coffee Break**

10:50 **Presentation 2** — Ghana's Policy Adjustment Experience
Vida Yeboah, Deputy Secretary, Ministry of Education and Culture

11:20 **Discussion:** Led by L.B.B.J. Machobani, Minister of Education, Kingdom of Lesotho

12:00 **Lunch (at the World Bank)**

1:40 **Presentation 3** — Tracking Policy Change and School Quality: Cases of Somalia and Liberia
Fran Kemmerer, State University of New York

2:10 **Discussion:** Led by Kenneth Tsekoa, Principal Secretary for Education, Kingdom of Lesotho

2:40 **Presentation 4** — Malawi's Policy Adjustment Experience
Edward Ngaye, Ministry of Education and Culture

3:10 **Discussion**

3:40 **Summary comments**

4:00 **Adjourn for Day 1**

Tuesday, November 15

9:00 **Presentation 5** — Senegal's Policy Adjustment Experience
Birger Fredriksen, World Bank

9:30 **Discussion:** Led by Tesfaye Dubale, Ministry of Education, Ethiopia

10:15 Coffee and workgroup meetings

12:00 Reconvene
Outline plan for afternoon discussion and synthesis of lessons-learned

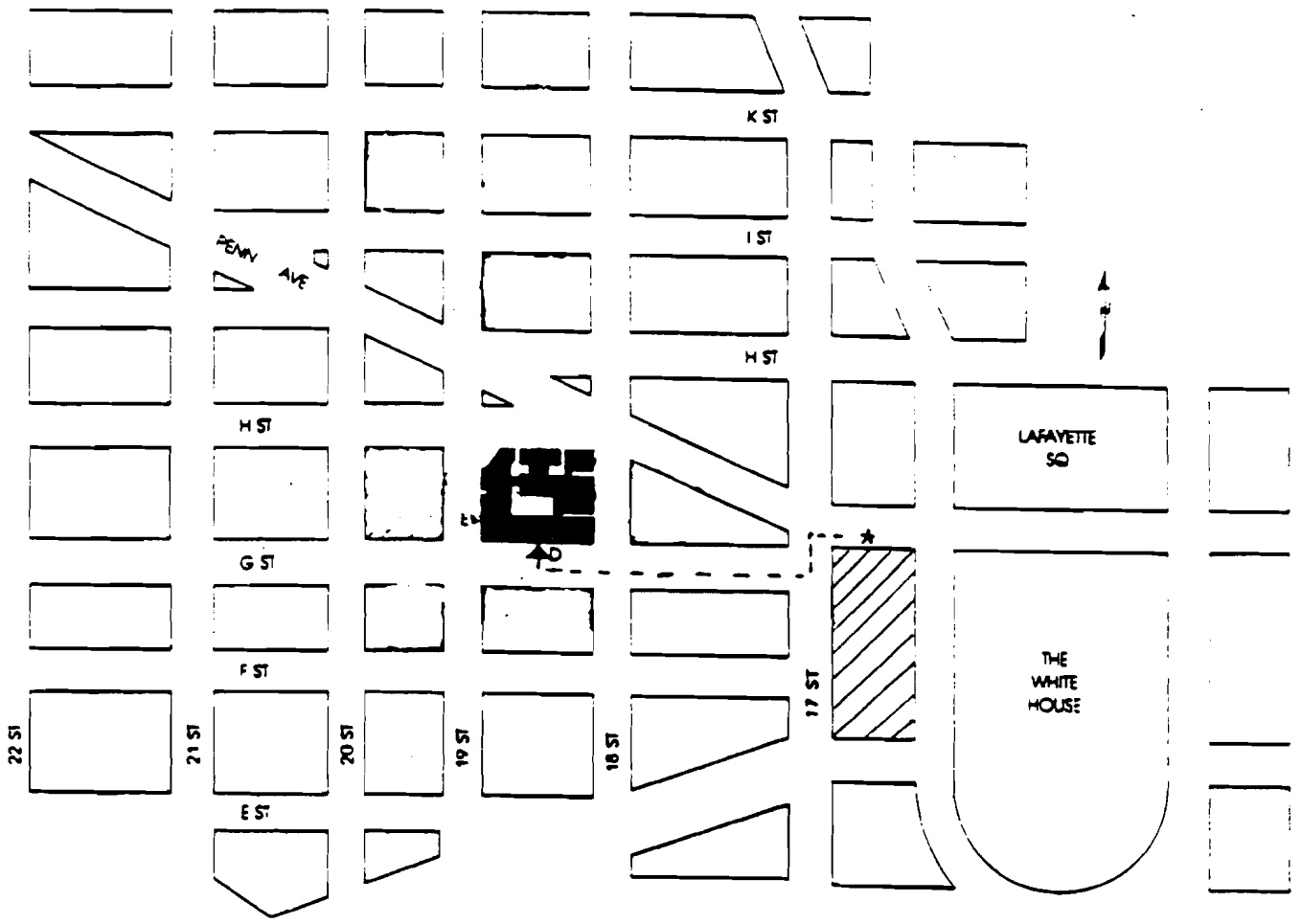
12:30 Lunch (at the World Bank)

2:00 **Roundtable reports from workgroups**
(remain at the Bank for afternoon session)

3:00 **Concluding summary comments**

3:30 **Final adjournment**

WORKSHOP LOCATIONS



■ The World Bank
Building D
1809 G Street, N.W.

(Lunches and Tuesday p.m.)

▨ Old Executive
Office Building
17th & Penn. Ave., N.
(Monday & Tuesday a.

EDUCATION POLICY ADJUSTMENT: IMPROVING QUALITY AND EFFICIENCY

Background Brief

The World Bank/USAID conference provides an opportunity to share early experience in two related areas. First, speakers will discuss how policy adjustment strategies in Africa are attempting to boost school quality and efficiency. Second, we will explore efforts to improve governments' management capacity and information. A question that underlies both topics: How can we strengthen the impact of central policy change at the school level (on costs, allocation priorities, and pupil achievement).

Over the two days, we will delineate lessons-learned regarding the efficacy of policy adjustment in raising school quality and efficiency.

The urgent task, 25 years ago in Africa, was to build more schools. Since then, governments have been remarkably successful in constructing the basic infrastructure. In 1960, less than one-fourth of primary-school age children were enrolled. Today over 75 percent of the child cohort enters school. Yet rapid expansion has come at a high price in terms of declining educational quality.

Many African governments can no longer keep up with explosive growth in child populations. Enrollment rates are now falling in several countries. Just to maintain current school enrollment rates, sub-Saharan Africa must provide 50 percent more school places between now and the year 2000.

This historical pace of school expansion can not be sustained, given tight economic constraints. In the 1980's GDP growth in Africa has lagged far behind population growth, or has declined in real terms. Debt service payments as a percent of GNP has tripled since 1970. The share of government spending allocated to education has declined in a majority of countries.

Eroding School Quality and Efficiency

Three numbers from one case -- Malawi -- illustrate this squeeze between rising popular demand for schooling and governments' shrinking capacity to deliver. Primary school enrollments have grown at 3.2 percent annually over the past decade. But real recurrent spending to this subsector has increased just 0.6 percent. Thus spending <u>per pupil</u> has declined at 2.6 percent each year. The ratio of pupils per teacher has risen from 41:1 in 1970 to 63:1 today.

Such dramatic declines in educational quality sharply restrict hoped-for economic effects from school expansion. Desired social and demographic impacts also diminish when minimal levels of literacy are not passed-on to children.

Given resource scarcities and political constraints, improvements in school efficiency are difficult to implement. Yet constraints on efficiency are defined not only by aggregate levels of resources; more careful allocation of existing funds by governments can boost pupil achievement. For instance, 95 percent of recurrent budgets are commonly allocated to teacher salaries, leaving little support for textbooks and instructional materials. The ratio of per pupil spending between higher education and primary schooling often exceeds 30:1, despite evidence showing that rates of return to basic schooling are greater. Excess social demand for secondary schooling persists, yet sources of cost-recovery remain limited.

Policy Adjustment / Monitoring Progress

This brings us to the present issue facing donors: Notwithstanding pressure to further expand basic education, how can we also assist governments to focus on the twin problems of low quality and low efficiency? How can improvements in management and information spark inventive discussion of policy and budget alternatives?

Experience is beginning to accumulate (within the Bank and USAID) on policy reform initiatives and assistance to improve educational management.

Last year, half of all Bank projects in education spoke to policy change, rather than only supporting school construction or instructional inputs. A small fraction actually conditions loan disbursements on policy change. Yet many loan operations now encourage innovative policies. Such efforts include policy/project packages aimed at expanding enrollments of marginal groups (access and equity), changes in teacher credentialing, curricular reform (quality), or reductions in grade-repetition or cycle unit costs (efficiency).

USAID, in recent years, has increased technical assistance for improving ministries' management information. This information provides governments the grist for exploring policy alternatives. These efforts mobilize simple computer technology and management reform to improve the allocation of scarce resources. USAID's assistance also enables governments to pin-down concrete indicators of school quality and efficiency, and to track change over time.

Central Issues for the Conference

Policy change -- what it looks like and how to implement it effectively -- is a huge topic. The following questions help focus our discussion:

Context. What external forces must governments respect and respond to? This may include demographic pressures, macro economic constraints, and social demand for more schooling. In the absence of policy change, what priorities are education ministries likely to express? Can some external forces be harnessed to help drive improvements in educational efficiency?

Implementing policy change. What conditions are conducive to bringing about policy change? How can in-country support for policy adjustment be broadened? What organizing processes have been attempted to widen consensus?

Content. What are useful ways of categorizing different policy adjustment packages (e.g., policy changes aimed at quality improvement, allocative efficiency, containing costs, broadening sources of school finance, or greater equity). What types of policy levers and management reforms are more politically feasible than others? Have strict conditionalities been effective in nudging governments to change policy? How can governments develop concrete indicators of school quality and efficiency? What forms of technical assistance are required to assist governments with related management and analytic tasks?

Monitoring effects. What evidence is available indicating that central policy change actually yields effects within schools? Local impact is not always an issue, say when policy change is focused on central financing methods. Yet efforts to boost educational efficiency should raise pupil achievement, or reduce costs with no decline in student performance. How can we better link central policy change with classroom-level effects?

This background paper does not intend to express official policies of any institution. Sources of cited statistics are available from the authors.

Joan Claffey / Bruce Fuller 2 November 1988

TAB 2

Outlines of Policy Adjustment Packages

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Box 4-4. Reducing per Pupil Costs through Double Shifts in Senegal

The gross primary enrollment ratio in Senegal was expected to fall from around 50 percent in 1986 to below 40 percent in 2000 owing to increases in the primary school population and growing pressures to contain public expenditure on education. In an effort to prevent this decline, the government of Senegal is planning to introduce measures that would lower the unit costs of primary education and increase the share of primary education in the education budget.

Senegal ranks first among low-income African economies in the average cost of primary education, which was $101 per student in 1983 (appendix table A-17). Teachers' salaries, which are between seven and nine times GDP per capita, account for much of the problem. Another factor is that student-teacher ratios are significantly lower in rural areas than in urban areas. Unit costs vary by as much as 110 percent in some cases. The use of teachers in administrative positions also contributes to the high unit costs.

One way to lower unit costs, increase enrollments, and reduce the amount of overcrowding in urban schools (which, it is believed, has contributed to declining pass rates in the primary completion examination since the late 1960s) would be to introduce a system of double shifts. Under this scheme a teacher who taught two shifts would receive 25 percent of his or her base salary as extra pay. In the double shift schools, classroom hours for students would be reduced from 28 hours a week to about 20; as partial compensation, the school year would be extended by 30 days and teachers would be given special training on how to utilize classroom hours more efficiently. If the double shift system were implemented in about 20 percent of the overcrowded classrooms and if it were initiated at grade 1 in the first year and extended to grades 2, 3, and 4 over a four-year period, the number of student places would increase by approximately 33,000 (6 percent of current enrollment) by 2000.

To have an even more pronounced impact on enrollments, double shifts could be implemented as part of a broader policy package for reducing unit costs. Other cost-saving elements that Senegal plans to introduce include increasing the proportion of *instituteurs-adjoints* (who have less training and are therefore paid less than *instituteurs*), redeploying 400 teachers from administrative positions to classroom teaching, and mixing two or more grades in underutilized rural classrooms (multigrade teaching).

In addition, Senegal plans to reduce the growth of expenditures for secondary education, higher education, and administration, reduce public funding for education fellowships, and limit the budget for campus services at the University of Dakar. These policies would yield substantial annual budgetary savings that could be reallocated to primary education.

If all of these policy measures, including double shifts, were implemented as a package, and if recent rates of real growth in the education and government budgets continue, an estimated 877,000 children could be enrolled in primary education in 2000, compared with 667,000 children if no new policies were introduced. This would mean a slight increase in the enrollment ratio between 1986 and 2000 rather than the precipitous decline that was projected.

Box 4-3. Reducing Teacher Costs in Burkina Faso

Efforts to expand the provision of primary education in Burkina Faso through the reduction of unit costs have been hampered by the relatively high cost of teachers. Although primary teachers' salaries are modest by international standards, they are high in comparison with the country's income level—more than 10 times GNP per capita, as against 2.4 times in Latin America and 2.6 in Asia. In light of the fact that 98 percent of the primary education budget goes for teachers' salaries, any attempt to reduce the costs to the subsector had to address this central issue.

The primary teacher work force consists mainly of two categories: *instituteurs-adjoints* (level B2 in the civil service salary scale), recruited from graduates of the lower secondary schools and trained for two years, and *instituteurs* (level B1), recruited from graduates of the upper secondary schools or through promotion by examination from the *instituteur-adjoint* level. Liberal standards for promotion from the B2 to the B1 level added to the budgetary pressure by driving up teachers' salaries at a fast pace.

Efforts to reduce teacher costs by increasing the pupil-teacher ratio were not attempted, since at 65 to 1 the national average was already quite high. Instead, Burkina Faso is lowering unit costs by restructuring the primary teacher corps and improving internal efficiency through better-focused teacher training. It has been demonstrated that by reclassifying newly recruited *instituteurs-adjoints* from level B2 to a lower-level C1 and reducing training for this group from two years to one, unit costs can be brought down significantly. Implementation of these policy changes, combined with a revision of current fellowship and subsidy policies, would produce resource shifts in favor of expansion of primary education. The country could thereby attain its unofficial enrollment target of 60 percent by 2000 while simultaneously realizing improvements in quality through an increase in teaching materials. If no policy changes were implemented, the gross enrollment rate would rise only in proportion to overall budgetary growth, falling far short of the 60 percent target.

The new *instituteurs-adjoints*, who will make up the standard teacher category in primary education, will receive training at the National Primary Teachers College in Loumbila. The course consists of pedagogical training (40 percent), general subjects (40 percent), and complementary courses such as agriculture and physical education (20 percent). These teachers are to receive field assistance through the provision of textbooks and teaching materials, regular pedagogical support, and a gradual decrease in class size.

In addition, the examination for promotion of primary teachers is being upgraded through the inclusion of general subjects to introduce a measure of selectivity into the process. This is expected to raise promotion requirements, thus slowing the overall rate of promotion and leading to a gradual reduction in the average teacher's salary.

Box 5-2. An Alternative Route to Secondary Schooling in Malawi

In 1965 the government of Malawi created the Malawi Correspondence College (MCC) as an alternative to the formal system, which could enroll only 9 percent of primary school graduates. The MCC evolved gradually over twenty years as the government recognized that it offered a relatively inexpensive way to respond to the growing demand for secondary education. The recurrent cost per student in an MCC study center is less than one-fifth of the recurrent cost of a student in a government secondary school, and the cost per graduate is slightly less than the cost per secondary school graduate.

The system is based on radio, correspondence, and the use of not fully qualified teachers who work with students in special study centers and in regular secondary schools at night. The only entrance requirements are a primary school leaving certificate and payment of a fee for correspondence materials. More than 80 percent of MCC students enroll at the junior secondary level and the rest at the senior secondary level. Although the MCC centers were originally designed to serve working youths on a part-time basis, over 70 percent of all students are now studying in classrooms for over five hours a day. By 1985 the MCC was enrolling more than 10,000 new students a year and providing to its approximately 19,000 active students fifteen hours of radio programs a week, correspondence materials, and a service that reviews and marks students' correspondence lessons.

MCC centers are generally located in simple buildings, often constructed by the community next to a primary school, and are frequently accompanied by simple housing facilities for students and teachers. In some cases centers make use of primary school buildings in the late afternoons and evenings. The teachers, who may have only a primary teaching certificate, are selected by local supervisors on the basis of their skills and interests. They are paid by local education authorities and are responsible for the general supervision of the classes. The MCC also provides classes in regular secondary schools after hours. These classes are often taught by regular secondary school teachers, who receive supplementary payments through the MCC.

Overall pass rates for MCC candidates on the National Junior Certificate Examination have been between 10 and 22 percent over the past few years. These pass rates are low compared with those of regular secondary schools, but they are satisfactory in the light of the MCC's much lower admissions standards.

The program became more attractive to students when the government made places at regular senior secondary schools available to all MCC students who passed the examination for the full junior certificate in one sitting and at the university to all who earned a full Malawi certificate of education in one sitting. This policy has been changed somewhat, and MCC graduates now have to compete on an equal footing with graduates of the regular secondary schools.

BASIC EDUCATION AND SKILLS TRAINING: BEST

The goal of this $45 million five-year program is to contribute to the economic and social development of Zimbabwe by providing budgetary resources to assist the GOZ to expand its educational and employment skills training systems with special emphasis on cost-effectiveness and equity. The purposes of the program are to provide additional financial and technical resources:

1. to assist the GOZ with strategic developments which will yield an educational system which is qualitatively appropriate and affordable and which will accommodate expanded primary and secondary enrollments; and

2. to assist with the expansion, diversification and modernization of the post-primary and post-secondary vocational technical training programs with which the formal educational system interfaces.

The program targets the following policy and programmatic changes in the existing systems:

1. reduction of the disparities in finance, trained teachers and instructional materials between schools and between geographic areas, with particular attention to the rural and private schools which provide education/training for the majority of students;

2. substantial increases in the numbers and percentages of children successfully completing primary school and continuing to secondary;

3. substantial improvement in the quality, relevance and instructional effectiveness of curricula, both in the schools and in the technical training programs;

4. increased availability of technical training opportunities in a wide range of skill areas, leading to productive employment and to a reduction of skilled manpower shortages which constrain investment and economic expansion; and

5. strengthened administrative management capacitites at various levels of the educational and training systems, leading to efficient use of resources and the moderation of recurrent finance burden.

The GOZ has broad latitude in deciding the specific uses of the grant. Activities to be funded are identified, reviewed and approved by an intraministerial committee of the Ministry of Education, the Ministry of Labor, Manpower Planning and Social Welfare, the Ministry of Finance, and the Minstry of Construction and USAID/Zimbabwe.

Activities proposed under the grant are expected to:

1. address a priority constraint identified in ministry development plans;

2. be consistent with the objectives of rapid quantitative expansion, qualitative improvement, increased learner achievement and more equitable distribution of opportunity;

3. contribute to the long-term improvement in institutional capacities, administrative practices or education and training policies; and

be cost effective and operationally efficient in the use scarce resources.

To date the program has provided funding for:

1. the construction and supply of the Belvedere Vocational Technical Teacher Training College in Harare;

2. more than forty operational experts (OPEXers) to fill line positions at various institutions and ministries; OPEX staff are serving in education, engineering, and medical science positions while their counterparts are being trained in the United States

3. computers and training for 65 computer stations at the Technical College at Bulawayo for instruction in engineering; computers and technical assistanace to the technical education and training division of the Mininstry of Labor for managemment planning; computers to the Mininstry of Education to enhance the Ministry's capacity to process data, to grade and process examinations, and to conduct research;

4. curriculum development in the secondary school sciences including the development of low cost science kits which provide laboratory capacity to all secondary schools and encourage participatory science curricula;

5. the development and construction of an Education Service Center which consolidates ministry sections responsible for curricula, teacher education, nonformal education and examinations. The Center is responsible for the design, development and testing of new approaches to the delivery of education; and

6. a variety of other projects including participant training.

Box 5-3. Community Financing of Secondary Schools in Zambia

Since independence in 1964, the government of Zambia has worked to provide basic education to all children. In support of this policy, the government in the 1960s phased out all school fees and provided free board and lodging to all secondary boarding school students. Revenues from mineral export sales met these costs. By the mid-1970s, however, Zambia faced a dramatic economic downturn, which led to severe reductions in public expenditures for education.

As public allocations for education have declined over the past ten years or so, a number of actions have been taken to pick up the slack. To increase the number of secondary school places, the government in 1975 began to encourage individuals and organizations to operate private schools that charged fees. By the mid-1980s the government was also requiring all non-Zambians whose children were being educated in the country to pay tuition and boarding fees and was allowing Parent-Teacher Associations (PTAs) to levy a boarding supplement to improve pupils' diets.

An important element in the mobilization of non-public resources to support education was official encouragement for the establishment of self-help schools in the late 1970s. Community reaction has been positive: between 1981 and 1984 sixty-two self-help secondary schools were created. Contributions of cash, materials, and labor by local communities have greatly expanded access to secondary education. Communities may also offer accommodations for weekly boarders in residents' houses while school dormitories are being built by the community, construct living quarters for teachers, and make private contributions in other ways; one PTA decided to pay teachers' rent. In addition, levies are made on pupils in the community schools to help finance projects and programs.

In government schools and in schools aided by grants, some recurrent educational expenditures have unofficially been transferred from the public budget to parents or other recipients of educational services. Textbooks, exercise books, rulers, erasers and other supplies, and school uniforms are now being paid for by the recipients. Parents of boarding school pupils pay for bedding and for soap and other toiletries. Parents also contribute to cover the costs of such items as entertainment, sports, and school development and maintenance.

Although private contributions have been essential to the education system, the government's response has been ambivalent. No guidelines have been issued regarding the items for which schools may charge parents, and for the most part school authorities and their PTAs have been left to determine the size of contributions to various funds. Some observers fear that the lack of monitoring by the government might lead to financial mismanagement and argue that a clear-cut official policy is needed. In light of Zambia's continuing economic difficulties and the growth of the school-age population, however, government responsibility for education is likely to decline further and private support is likely to become increasingly important in the financing of education.

Box 12. Public Subsidies Aid Private and Local Schools

In some developing countries, private schools are subsidized to varying extents. In Africa, a significant proportion of private schools receive government assistance. During 1980–81, 9 percent of Kenya's total public budget for secondary education assisted private harambee schools built by local communities through self-help (see box 11). Schools assisted by the Kenyan government account for 35 percent of total private school enrollment (Bertrand and Griffin 1984, pp. 18–19). In Lesotho, churches own and operate 97 percent of the primary and 86 percent of the secondary schools, though the government administers examinations, reviews and authorizes curricula, opens and closes schools, inspects the operation of all schools, and trains, appoints, and pays teachers. A similar system operates in Mauritius. In Tanzania, the government recently made private schools eligible for subventions from district and town councils. Although such schools are required to follow government guidelines on student admission, the government will not take over or manage them (Government of Tanzania 1984).

In Asia and Latin America, state assistance for private schools is less prevalent. In the Philippines, for example, donations and grants cover only 1 percent of all revenues received by private schools; the rest comes from tuition fees. In Bolivia, Colombia, Mexico, Peru, and Venezuela, state subsidies are small, and only some special schools receive them (Munoz and Hernandez 1978). Nevertheless, some Latin American and Asian governments have begun to transfer more funds to private schools rather than expand public schools. For instance, in 1983 Chile set aside 20 percent of the public educational budget for primary and secondary schools to be used in private institutions. Indonesia is considering a program to expand enrollment by subsidizing private schools.

Box 14. Cost-Recovery Reforms Are Already Afoot

Despite political obstacles, several countries have begun to reduce subsidies for secondary and higher education.

Barbados

Until 1983, graduate teachers in Barbados could qualify for training in the teacher training college after one year's teaching and receive a full salary and free tuition while doing so. Today, free tuition and full salary for trainee teachers are being replaced by student loans. All trainees are expected to repay their loans out of the considerably higher earnings they will receive as qualified teachers.

China

China's government recently announced a gradual reduction in educational grants and subsidies for university students. Those who have the means are now required to pay their own way. Others will begin to pay a nominal fee and some of their expenses. Academic performance will be an important criterion in awarding scholarships to students in higher education (*Washington Post*, May 30, 1985).

These reforms closely follow earlier decisions by the Chinese government to lift restrictions on the operation of private schools. In Beijing and provincial cities, private schools offer courses in such diverse subjects as tailoring, foreign languages, typing, chicken raising, art, and drama. Typically, the fee collected from a class of about thirty students can support a private teacher. Unlike their counterparts in the public school system, graduates from private schools are not guaranteed a job at the end of study. Yet "some parents prefer to send their children to a private school because, having paid their fees, the pupils observe better discipline" (*Times*, London, January 3, 1983).

Ghana

In 1971, Ghana's government began to charge university students for room and board. Those unable to afford the fees could seek student loans. The subsidy provided to each university student that year was 3,000 cedis, compared with only 20 cedis for each primary school pupil. Under the proposed loan scheme, annual repayments would amount to only 20 percent of the additional income of university graduates. Despite initial opposition from students, university enrollment held steady once the loan scheme was instituted. The experiment was abandoned by a new government, although the National Education Commission recently recommended reintroducing the student loan scheme. Also, students will soon be charged for room and board.

India

India's five-year plan for 1985–90 states, "The new approach to education will require substantial outlays . . . Mobilization of community resources . . . are essential together with accountability at the local level . . . The level of subsidies for secondary and higher education courses will need to be considerably reduced" (Government of India 1984, p. 26).

Malawi

Secondary school fees in Malawi were increased by 50 percent in 1982 without significantly increasing the dropout rate. The government is considering fees for higher education, and further increases in secondary fees.

Morocco

In 1983, Morocco's government announced that university stipends (worth 880 dirhams [Dh] [US$125] per month for the first two years and Dh1,400 [US$198] per month for the third) would be cut by half, except for students from very poor homes. Students in teachers' education courses also had their *presalaire* of Dh1,030 (US$146) per month cut by half.

Nigeria

Nigeria's government recently announced a reduction in subsidies for student accommodation and board in universities (*West Africa*, September 3, 1985). It has also begun to decentralize the financing of education. In Ondo State, for example, the local government plans to charge higher fees at all levels of education. Primary schools would retain 20 percent of the funds collected and secondary schools, 50 percent, for their own use. Third-level institutions in Ondo would also be "free to charge levies according to their need to supplement the efforts of the government" (*Daily Sketch*, March 29, 1985).

Solomon Islands

During the October 1984 election campaign in the Solomon Islands, one political party advocated abolishing fees, but many citizens countered that their concern was not free education but rather increased educational opportunity and quality. Apparently, some parents are prepared to bear a greater share of total educational costs if their contribution can be clearly linked to the improvement of education.

Tanzania

In 1981, only 3 percent of all age-eligible children in Tanzania had places in secondary schools, compared with 100 percent in primary school. The government recently decided to expand secondary school places to absorb at least 15 percent of the primary school leavers (Government of Tanzania 1984). At the same time, the government has decided that in view of rising costs and budgetary constraints, the "parents of pupils attending secondary schools will now be required to contribute towards part of the cost of their children's education" (p. 17). In 1985, annual fees were set at Sh1,600 (about US$93—about what a clerk earns in two months.

Education in Sub-Saharan Africa

Policies for Adjustment, Revitalization, and Expansion

The World Bank
Washington, D.C.

Contents

Notes on the Data

Most of the discussion and all of the statistics about Africa in this study refer to just thirty-nine countries south of the Sahara, for which the terms Africa and Sub-Saharan Africa are used interchangeably. The appendix lists and provides comparative information on these countries.

"Dollars" means U.S. dollars.

"Billion" means one thousand million.

Summary

African societies have a long and rich history of education and training. Indigenous education among all groups remains an important transmitter of cultural identity from one generation to the next. In addition, Christianity and Islam have for centuries had a pervasive influence on education, community life, and perceptions in many parts of the region.

In the colonial era, missionaries and metropolitan governments opened up a network of Western-type schools in Africa. The administration of education systems was dominated, however, by expatriates, as was teaching beyond the primary level. Moreover, access to education was quite limited, especially in the thinly populated areas of French West Africa. By 1960, the gross primary enrollment ratio in all of Sub-Saharan Africa was still only 36 percent, about half the levels then found in Asia and Latin America. Many countries—including The Gambia, Côte d'Ivoire, and Senegal in West Africa and Tanzania and Somalia in East Africa—had literacy rates below 10 percent at the time of independence.

Educational Development in Africa

The education systems inherited by the African nations at the time of independence were thus quite inadequate to meet the needs of the new countries for self-governance and rapid economic growth. From this low starting point, the progress achieved in African education has been spectacular. Quantitative expansion has been particularly impressive.

Progress since Independence

Between 1960 and 1983 the number of students enrolled in African institutions at all levels quintupled to about 63 million. Enrollments increased about 9 percent annually during the 1970s, double the rate in Asia and triple that in Latin America. At the primary level, the gross enrollment ratio rose from 36 percent in 1960 to 75 percent in 1983. At the tertiary level, the number of students enrolled in African institutions had reached 437,000 by 1983, growing from just 21,000 in 1960. The substantial expansion of education since independence has increased the participation of some groups who had previously had little or no access to formal education.

This massive educational expansion has substantially improved the human capital stock. The estimated average educational attainment of working-age men and women in the median African country increased from less than half a year in 1960 to more than three years in the early 1980s. The adult literacy rate in the median country rose from about 9 percent to 42 percent.

The Current Challenge

The advances since the early 1960s are now seriously threatened—in part by circumstances outside education. Africa's explosive population growth greatly increases the number of children seeking access to schools and increases the number of potential illiter-

ates. Between 1970 and 1980 Africa's population grew at 2.9 percent a year, a full percentage point higher than the worldwide rate. Between 1980 and the end of the century, Africa's population is projected to grow at 3.2 percent a year, its primary- and secondary-school-age population at 3.3 percent. If the growth of educational places is to keep pace with the growth of the school-age population, more schools, teachers, books, and other inputs are required each year. This requirement comes at a time when economic decline has necessitated significant cutbacks in public spending. Public spending on education in Africa has dropped from $10 billion in 1980 to $8.9 billion in 1983. These fundamental facts sharply constrain the options open to policymakers and have serious implications for African education policy.

The main educational issues in Africa today are the stagnation of enrollments and the erosion of quality. Although total enrollments in Sub-Saharan Africa grew at an average annual rate of 6.5 percent during 1960–70 and 8.9 percent during 1970–80, the rate of increase plummeted to 4.2 percent in the first three years of the 1980s. The slowing of enrollment growth affected all levels of education but was most evident at the primary level, where the rate of growth fell from 8.4 percent a year during 1970–80 to 2.9 percent in 1980–83. If the population of primary-school-age children increases at the projected average annual rate of 3.3 percent, a 2.9 percent increase in enrollments will not even keep pace. And as long as enrollments stagnate, current inequalities in access to education are not likely to be eliminated. Male-female differentials remain a particularly serious problem in most African countries, especially past the primary level.

Complicating the problems of stagnating enrollments are the low levels and recent erosions of educational quality. Cognitive achievement among African students is low by world standards, and there is some suggestion of further decline recently. Much of the evidence is indirect: supplies of key inputs (especially books and other learning materials) are critically low, and the use of these inputs has declined in relation to the use of teachers' time and of physical facilities. Less is known about the output—the performance of students. But in the few cross-national studies that have been conducted, academic achievement in Africa has been sufficiently poor to be a cause for serious concern.

Addressing these issues of stagnation and low quality will require additional resources. Equally important, it will require profound changes in educational policy for many countries. Indeed, for most African countries, the first will not be obtainable without the second.

A Policy Framework

Hard decisions on education policy should not be postponed. In most African countries the cost would be continued stagnation of enrollment and decline in quality through the 1990s. This study urgently recommends that each African nation now embrace the task of formulating and implementing an internally coherent set of policies that reflects the nation's unique history and aspirations and that effectively addresses its own recently exacerbated problems in the education and training sector. Although the particulars of the policy packages can be expected to vary from one country to the next, every country-specific package needs to contain, in varying proportions, three distinct dimensions: adjustment, revitalization, and selective expansion.

Although undoubtedly painful and politically difficult, adjustment policies will alleviate the burden of education and training on public budgets. Measures for revitalization and expansion, however, will certainly require additional resources. Thus, in the context of ongoing austerity in Africa, resolute movement toward adjustment is a necessary condition for implementing forward-looking policies on the other two dimensions. Moreover, if new policies are in fact to be implemented, management practices will need to be improved.

Adjustment

Adjustment to current demographic and fiscal realities, though it will be difficult, is essential if the disruptive effects of these external factors are to be minimized in the years ahead. Adjustment will take two main forms:

- *Diversifying sources of finance.* A necessary part of country-specific policy packages, diversification can be achieved through increased cost sharing in public education and through increased official tolerance and encouragement of nongovernmental suppliers of educational services. For many African countries, increased user charges in public education will be inevitable, but this policy should be directed especially at the tertiary level, where more than a third of public expenditure in the typical country now covers student welfare costs, as distinct from pedagogical costs; for most African countries, the scope for further cost sharing in primary education is negligible or nonexistent.
- *Unit cost containment.* In the adjustment process,

the containment of unit costs will be just as important as, and in many countries probably more important than, policies to diversify sources of finance. The most promising areas for containing costs are utilization of teachers, construction standards, and the tendency of students to repeat grades or drop out of school.

Revitalization

Revitalization of the existing educational infrastructure is the second dimension of a properly conceived educational strategy. Renewed emphasis on fundamentals is needed to take maximum advantage of the current capacity of education and training systems. Three kinds of measures are necessary for the restoration of quality:

- A renewed commitment to academic standards, principally by strengthening examination systems.
- Restoration of an efficient mix of inputs in education. A minimum package of textbooks and other learning materials is usually the most pressing need.
- Greater investment in the operation and maintenance of physical plant and equipment, and greater expenditure on other inputs that would increase the utilization of these capital assets.

Selective Expansion

The selective expansion of educational services is the third dimension of any complete strategy for educational development. Measures in this area, viable only after measures of adjustment and revitalization have begun to take hold, will concentrate in four areas; success in all will depend upon a general effort to safeguard the quality of instructional staff at all levels:

- *Renewed progress toward the long-term goal of universal primary education.* Expanding access to primary education should remain a high priority in most African countries. To maintain the high economic and social returns that have accrued to this investment in the past, however, parallel efforts are required to combat the incidence of disease and malnutrition among young children.
- *Distance education programs.* At the secondary level, and later on at the tertiary, expansion of enrollments in selected subjects and streams will be necessary in most countries as soon as appropriate measures of adjustment and revitalization have been put in place. To accommodate these increases in postprimary education, most countries will need to consider alternative ways of delivering educational services that shift more of the burden for learning onto the students themselves. Now is the time to begin planning such programs and developing the correspondence materials, radio programs, examinations systems, and other support that will be needed.
- *Training.* Training for those who have entered the labor force must be increased. This training should serve both school leavers and those who have had no exposure to formal schooling, and it should be designed to ensure that individuals can acquire the necessary job-related skills and renew these skills during their working lifetime in response to changing market conditions.
- *Research and postgraduate education.* Expansion of Africa's capacity to produce its own intellectual talent to fill the highest scientific and technical jobs—in educational establishments, in government, and in the private sector—is a critical matter to be addressed in building for Africa's future. Here, as with programs for distance education, economies of scale are likely to be important, and these will be difficult to achieve fully within a national context except, perhaps, in a few of Africa's largest and wealthiest countries. The pressing need is for Africa to develop, probably with the support of the international donor community, regional and subregional approaches to these particular goals.

Formulation and Implementation of National Programs

For most African countries, the formulation of a comprehensive and coherent educational development program, derived from a balanced package of policies for adjustment, revitalization, and selective expansion, will be a new experience. Each country will organize for the task in its own way. In many countries, however, a fruitful approach to policy design might be expected to include the following: establishing a national commission to oversee the work; constituting a technical staff to support the commission; for both, drawing upon the nation's best political judgment and analytical talent, from the ministries of finance and planning as well as education, and from institutions of tertiary education and research; building a national consensus through public debate of the emerging findings and recommendations; and taking advantage of the experience of other African countries in developing the nation's own educational development program. Budgetary flows would have to be sufficient to cover not only the personnel costs of the national commission but

also its operating expenses for travel, communications, publications, and specialized contractual services (such as data collection and processing, expert technical consultants, targeted research, and analysis).

Although the careful elaboration of educational development programs is essential, African capacity for implementation will ultimately determine the effectiveness of the programs. Improvement in education management is a necessary concomitant to policy reform and must be given immediate and continuing attention.

Management at the national level may be significantly improved by delegating various administrative functions. Some functions, however, must appropriately remain with the central ministry, and the performance of these functions will need to be improved. But the toughest challenge to improving management lies closer to the classroom, at the level of individual schools and districts. African policymakers should consider how, with adequate safeguards against abuses, schools and the local communities they serve can be given more authority in the acquisition and utilization of the resources essential to effective classroom teaching and learning.

In addition, central ministries must tend more seriously to the development of their own managerial capacity, especially in monitoring performance and policy planning and analysis. Improvements are needed in examination systems (which was mentioned above with reference both to academic standards and to distance education), in the nature and timely availability of statistical and financial accounting information, and in the number and qualifications of staff engaged in full-time analytical work. Incentives in many ministries of education are insufficient to attract, motivate, and retain able staff. Governments committed not only to the formulation of an educational development program but also to its expeditious implementation will need to be imaginative in addressing the issue of incentives at all levels of the education system.

Policy Options by Level of Education

The mix of adjustment, revitalization, and expansion components that is appropriate in light of country-specific conditions and goals can be expected to differ. Within a country, the mix will differ also among levels of education.

At the primary level in most African countries, there is only limited scope for adjustment in the form of either lowered unit costs or increased cost sharing. There is, however, good potential for improving the quality of output—that is, for revitalizing primary education by changing the input mix to include more textbooks and learning materials. At the secondary level there is far more scope for containing unit costs—partly through making fuller use of available resources and partly through switching to cheaper ways of providing services. Higher education poses a set of problems uniquely its own. Rapid expansion has left in its wake an abundance of institutions, programs, and graduates that are often of low quality and dubious relevance. Modest consolidation, an adjustment measure that would lower unit costs, and increased cost sharing are the first steps on the road to higher education's revitalization, which must be regarded as a prerequisite for any further expansion of the subsector.

Primary Education

During the 1960s and 1970s some analysts warned that Sub-Saharan Africa's preoccupation with the quantity of education would lead to a serious deterioration in its quality. In the countries where educational standards have deteriorated the most, the choice between expansion and quality is no longer an either-or choice. Without some basic revitalizing inputs, particularly textbooks and instructional materials, almost no learning can be expected to occur. Ensuring the availability of essential inputs is a prerequisite both for quality and for expansion. Beyond this minimal level, however, are the questions of finding for each country an appropriate balance of quality and quantity—and of identifying efficient approaches to enhance quality and expand enrollments, and of financing both improvements.

A review of possible measures for improving the quality of primary education yields two broad conclusions:

- First, the safest investment in educational quality in most countries is to make sure that there are enough books and supplies. These materials are effective in raising test scores and, almost invariably, are underfunded currently relative to teachers' salaries. External aid might be used to address this problem in the short run, especially where foreign exchange is a governing constraint. Other possibilities for improving quality are found in school feeding and health programs, intensive use of radio, in-service education of teachers in subject matter, and stronger systems of inspection and supervision.
- Second, some investments are *not* likely to have a noticeable effect on primary school quality despite their potentially high costs. These investments include reducing class size (within the

range of 25 to 50), providing primary teachers with more than a general secondary education, providing teachers with more than minimal exposure to pedagogical theory, constructing high-quality buildings, and introducing televisions or computers into classrooms.

Even with no quality improvements (and assuming no improvements in efficiency), the resources devoted to the primary level would need to increase more than 3 percent a year just to keep pace with population growth. There is, however, little likelihood of significantly reducing unit recurrent costs at this level, especially if countries hope also to improve the quality of education. There is greater scope for reducing unit capital costs, but even so it is unlikely that overall per pupil costs can be reduced very much at the primary level. Thus the further growth of primary education will require additional resources.

Secondary Education and Training

Can adjustment measures at the secondary level generate sufficient savings to provide the necessary books and supplies and, at the same time, significantly expand capacity? Substantial economies are possible in the operation of regular schools. Boarding costs can also be reduced. And, most significant, there can be economies from the creation of distance education systems that combine radio and correspondence techniques and reduce (but do not eliminate) the amount of face-to-face interaction with qualified teachers. Such systems would extend secondary education of reasonable quality to many more communities than could be reached in any other way for the same price.

Beyond this general support for expanding access to secondary education, African governments should give serious consideration to policies designed to remedy existing inequalities in school participation. Females are the largest group underrepresented in postprimary education in Africa. Small, community-based schools (whether or not they rely on distance education) will tend to attract girls more readily than larger schools located in urban centers and at greater average distances from homes. Although smaller conventional schools may imply higher unit costs, this is not necessarily true if larger schools tend to include boarding facilities while smaller schools do not. Increasing the number of female teachers may also attract more girls, especially in Islamic areas.

Another set of issues to be addressed mainly at the secondary level concerns the relevance of the curriculum to the needs of individuals and societies. The main questions that many countries face are when and how to make the transition from programs and subjects that have broad vocational relevance (language, mathematics, and science) to programs and subjects that will prepare individuals for specific jobs or clusters of jobs. International experience shows that a strong general education, which schools can provide efficiently, greatly enhances an individual's future trainability. It also shows that job-specific training is very important. Such training usually is most efficiently provided after initial job decisions have been made and in institutions under, or strongly influenced by, the ultimate employer. Occupation-specific and job-specific training need not provide individuals with degrees or credentials.

Because of the high costs and tenuous vocational relevance of much school-based training for specific jobs and occupations, there is an urgent need to establish industrial training centers and to encourage (through incentives and technical assistance) local enterprises to offer skill development programs and other types of on-the-job training. Governments interested in laying the groundwork for a more technically oriented economy should place heavier emphasis on general mathematics and scientific skills in the secondary and postsecondary curriculum. These programs are relatively inexpensive and are generally more conducive to economic growth than is in-school vocational education.

Higher Education

Preparing and supporting people in positions of responsibility—in government, business, and the professions—is the central and essential role of the continent's universities. In numbers at least, the universities have risen impressively to this challenge. Enrollments grew from 21,000 in 1960 to more than 430,000 in 1983.

Higher education's contribution to development in Africa is being threatened, however, by four interrelated weaknesses. First, higher education is now producing relatively too many graduates of programs of dubious quality and relevance and generating too little new knowledge and direct development support. Second, the quality of these outputs shows unmistakable signs in many countries of having deteriorated so much that the fundamental effectiveness of the institutions is also in doubt. Third, the costs of higher education are needlessly high. Fourth, the pattern of financing higher education is socially inequitable and economically inefficient.

Wherever the foregoing diagnosis of weaknesses in higher education can be confirmed, policy reform should seek four objectives: (a) to improve quality;

(b) to increase efficiency; (c) to change the output mix, which may imply smaller enrollments in certain fields of study; and (d) to relieve the burden on public sources of financing by increasing the participation of beneficiaries and their families. But quality improvements, the first objective, will cost money. Thus, implementing adjustment policies to achieve the other three objectives will, almost everywhere in Africa, be a prerequisite for freeing the resources needed to achieve the first.

The Role of the International Donor Community

This study argues that adjustment measures are needed to alleviate the burden of education and training on public budgets in Africa. The "savings" generated by lower unit costs, increased cost sharing, and greater tolerance of the private provision of educational services can be used to help fund the necessary revitalization and ultimate expansion of the sector.

Regrettably, all such savings from adjustment measures will not be sufficient, in most countries, to cover the substantial resources needed to revitalize and build African education to the extent essential for future development. International aid will remain a critical determinant of the pace of progress of education in the region. However, the rapid evolution of African needs, as summarized in the three dimensional framework for policy reform, demands corresponding changes in the organization and nature (and not just an increase in the level) of international aid for African educational development.

The pressing requirement is for aid in support of policy reform. The international donor community should quickly offer three related kinds of support for the design of national policy.

- The first form of planning support is simple: seed money to cover both the local and foreign costs of developing policies and improving management. The willingness of the international donors to bear a part of these extraordinary expenses, perhaps on a matching basis, would provide an important incentive for African governments to review their policies for the sector.
- The second kind of support that the international community should provide is ready access to the ongoing experience of other countries in formulating and implementing policy reform. Intensive collaboration among countries, so that they share their accumulated experience widely, should pay high dividends as countries grapple with common issues.
- Third, the international donor community should establish and finance a source of high-quality specialized technical expertise without direct financial or political ties to any government or international donor. African governments could call on this expertise for help in formulating policies at the outset, and in monitoring, evaluating, and correcting them during implementation.

Appropriate mechanisms do not now exist for meeting these three interrelated needs for the improvement of policy development. The requirement is for expeditious action to develop them. Any donor initiative in this area that would take more than a year to get started would be an inadequate response to the needs of African governments.

Beyond its assistance in policy design, the international community should help finance the implementation of sound programs. These programs will typically require more resources, for a longer period, than can be mobilized internally. Countries that have demonstrated their willingness to address policy issues should have access to increased, longer-term, and more flexible international aid. To the extent that a country's policy package involves thoroughgoing reform, there are likely to be substantial one-time transition costs to a new and more sustainable policy regime.

The international commitment to the reform program must be seen from the beginning as continuing, a characteristic that has been missing in the past. In addition, the sum total of aid to different levels of education and different expenditure categories should reflect, at least in very rough terms, the priorities given to these levels and categories in the national program. In recent years, only 7 percent of international aid to African education has been used for primary education, compared with 16 percent for general secondary education, 33 percent for vocational and technical education (including teacher training), and 34 percent for higher education. In terms of expenditure categories, only 11 percent of aid has been used to support operational costs (local salaries, consumable supplies, and instructional materials). The donor organizations, both individually and as a group, need to review these allocations to make sure that they are consistent with the programs being formulated by African governments for the development of education and training.

Why Meet the Challenge?
The Expected Benefits of Education

Greater investment in education can, at this time in Africa's history, be expected to yield broad economic benefits. These benefits include higher incomes and lower fertility. The research evidence to this effect is

compelling. A caveat, however, is in order. The studies examining the welfare benefits of education are based necessarily on education as provided at some historical point in the past. To the extent that the quality of education has declined recently and is allowed to deteriorate further, new investments in the quantity of education may not yield returns commensurate with those in the past. Hence the strong emphasis in this study that quality be enhanced through revitalization as a prerequisite and complement to further expansion.

Assessments of the labor market returns to past investments in education have consistently found rates of return above 10 percent and sometimes above 20 percent—rates that compare favorably with those in most sectors in Africa today. A recent study on the long-term impact of educational investments on development in thirty-one African countries corroborates the microeconomic findings of education's high returns.

Increased investment in the quality and quantity of education can also be expected to reduce fertility. In general, there is a strong negative relationship between how much education a woman receives and the number of children she bears during her lifetime. Men and women with more education, in addition to having fewer children, tend to live healthier and longer lives. And numerous studies have shown that parents' education affects children's survival and enhances their physical and cognitive development.

The benefits of education go far beyond those for income and fertility, however. The rapid transition in Africa from colonial status to self-government to participation in the international arena was possible only because African educational systems produced people to replace expatriates at all levels. The nurturing of leaders who can address the increasingly complex tasks of nation-building is a continuing responsibility of African education. In addition, the stock of human capital in Africa will determine whether Africans can harness the universal explosion of scientific and technical knowledge for the region's benefit—or whether Africa will fall farther and farther behind the world's industrial nations. Above all, education is a basic right, an end in itself, an intrinsic part of life and development. When all the benefits of education are considered, the case for revitalization and expansion of schooling and training in Africa is compelling, even in this period of unusal scarcity.

3

Policy Packages for Educational Development

Hard decisions on education policy can be postponed—but only at the cost in most African countries of continued stagnation in enrollment and decline in quality through the 1990s. Part II of this study has reviewed a series of policy measures—some of them admittedly difficult—that hold the promise of restoring quality and resuming an orderly expansion of enrollments. This chapter suggests that each African country should now embrace the task of formulating and implementing an internally coherent set of policies that will reflect the country's unique history and aspirations and effectively address its own recently exacerbated problems in the education and training sector. Although the particulars of the policy packages that emerge from this exercise would vary from one country to the next, it is nonetheless clear that every country-specific package will need to contain, in varying proportions, elements of policy along three distinct dimensions. These three are adjustment, revitalization, and selective expansion. Moreover, if new policies are in fact to be implemented, management practices need to be improved.

The three dimensions of policy are defined below and further elaborated in the course of the chapter. The closing section of the chapter discusses organizational issues associated with next steps in policy development and implementation.

Adjustment to current demographic and fiscal realities, though it will not be easy, is essential if the disruptive effects of these external factors are to be minimized in the years ahead. Adjustment will take two main forms:

- The diversification of educational finance will be a necessary part of country-specific policy packages. This diversification can be achieved through increased cost-sharing in public education and through increased official tolerance and encouragement of nongovernmental suppliers of educational services.
- The rigorous containment of unit costs will be just as important as the diversification of finance, and in many African countries may be more important, in the adjustment process.

Revitalization of the education infrastructure that now exists in order to restore quality is the second dimension of a properly conceived educational strategy. This dimension gives renewed emphasis to the fundamentals of providing education services, so that maximum advantage is extracted from the current capacity of education and training systems. Three kinds of measures are necessary for the restoration of quality:

- Textbooks and learning materials must once again become generally available in African classrooms.
- There must be a renewed commitment to academic standards, principally through strengthening examination systems.
- Greater investment must be made in maintenance of physical plant and equipment and in operational expenditures.

Selective expansion to address needs for additional education services is the third dimension of any

complete strategy for educational development. These measures, viable only after measures of adjustment and revitalization have begun to take hold, will concentrate on four areas; success in all will depend on a general effort to safeguard the quality of instructional staff at all levels.

- Renewal of progress toward universal primary education is the new investment that will bring the highest economic and social returns in many countries.
- At the secondary level, and later at the tertiary, expansion of enrollments in selected subjects and streams will be necessary in most countries in the years ahead. To accommodate these increases in postprimary education, most countries will need to consider alternative delivery modes that shift more of the burden for learning onto the students themselves; now is the time to begin planning for such programs and developing their requisite support infrastructure (correspondence materials, radio programs, and examination systems).
- The amount of training that occurs once individuals have entered the labor force must be increased; this training should serve both school leavers and those who have had no exposure to formal schooling, so that individuals can acquire the necessary job-related skills and renew these skills during their working lifetime in response to changing market conditions.
- Expansion of African capacity to produce postgraduate intellectual talent to fill the highest scientific and technical jobs in education establishments, in government, and in the private sector is an important matter to be addressed in building for Africa's future.

The message here is contained in recommendation 6.

Recommendation 6

To maximize education's contribution to economic growth in the years ahead, African governments should design and begin expeditiously to implement long-term education sector development programs. Each government will need to select, from among the many policy options available (including, but not restricted to, those discussed in this study), a consistent package of policies that effectively addresses country-specific problems and serves country-specific goals. Although the optimal policy package will differ from one country to the next, no country can afford, in light of education's high costs and its crucial role in the development process, to neglect this task. The policy package that emerges will, in every country, contain elements of three strategic dimensions—adjustment, revitalization, and selective expansion. Given the pressure of population growth and fiscal constraints, most countries will need first to implement painful adjustment measures so as to generate the necessary resources for quality-enhancing revitalization, and adjustment and revitalization should be regarded as prerequisites for the longer-term return to selective expansion of the educational system.

Adjustment

The two elements of an adjustment program for education and training are diversifying the sources of finance and containing unit costs.

Diversifying Sources of Finance

The imperative here is to acquire from the beneficiaries of education and training a much larger share of the real costs of providing these services. With regard to training, an increase in cost-sharing is a normal concomitant of moving the locus of training closer to the workplace, a move justified on other grounds elsewhere in this study. With regard to education, the rationale for increasing cost-sharing is strongest at the tertiary level but may, in some countries, be pertinent at lower levels as well.

Increased cost-sharing can be achieved through a variety of measures. First, countries might consider encouraging the establishment of, and relaxing regulations that currently constrain the operation of, privately owned and privately financed institutions of secondary and higher education. Encouraging and facilitating the efforts of local groups or NGOs to construct, finance, and operate schools, especially at the primary and secondary levels, can be expected to result in more resources to and better management of education in response to local needs.

Second, there is a clear rationale in secondary and tertiary education in many African countries for making students or their families more responsible for the costs of food, lodging, and other living expenses unrelated to instruction. These are costs that must be borne whether or not individuals are enrolled in school. There is little if any justification for financing these costs out of the public budget, especially in poor countries where only a minority (and, nearly always, a relatively well-to-do minority) is enrolled at secondary and tertiary levels.

In addition to (or instead of) requiring students and their families to bear these costs, students themselves could be required to perform a variety of instruction-

related support tasks now assigned to nonteaching staff (custodial care of teaching facilities, upkeep of the grounds, clerical and secretarial assistance, and other administrative support). Student provision of such services in kind, a widespread practice in many industrial and developing countries, is a potentially important approach to alleviating the public financial burden of secondary and tertiary education.

Finally, some countries will need to introduce or raise tuition fees in public establishments to cover at least part of the costs of instruction. Especially in higher education, however, full cost-sharing could result in many potential students finding themselves excluded from education because of their families' inability to pay. To the extent possible, ability to pay should not be a factor that determines who receives education and who does not.

Therefore, alternative modes of financing the increased private costs of education would need to be introduced. Possibilities include: opening opportunities for students to get tuition waivers by making commitments to national service (for example, to teach school) before, during, or after enrollment; promoting student loans and other education credit markets; and, during a period of transition to an effective system of graduated income taxation, imposing a special tax on the earnings of graduates of tertiary institutions. For most policies intended to decrease the government's share of full educational costs, implementation would need to be phased in gradually over a period of some years. And legitimate concerns on the policies' effects on equity would need to be addressed.

Containing Unit Costs

The containment of unit costs, the most important component of adjustment in much of Africa, should be aggressively pursued at all levels of the education system in both the capital and recurrent accounts. The goal here is to reduce the economic costs per student, or per completed cycle, at each level (and not necessarily to reduce the total aggregate expenditure at any level).

Reducing construction costs and raising utilization rates for physical facilities offer considerable potential for reducing unit capital costs. Since annualized capital costs can account for 40 percent or more of the direct economic costs of education in Africa, careful attention to capital costs is a high priority. Too many existing educational facilities (particularly those financed in part through foreign assistance) cost a sizable multiple of what best practice has shown to be possible. Chapter 2 projected the probable magnitude of capital expenditure in education budgets in the coming years under the assumption that best practice would prevail. In order to contain construction costs to the levels there indicated, it will be necessary to minimize expenditure on pedagogically redundant civil works (such as boarding facilities, auditoriums, cafeterias, and sports complexes) and to use low-cost construction methods and local materials. In addition, particularly at the secondary and tertiary levels, there is scope for more intensive utilization of existing facilities through extension of the teaching calendar. There is little or no justification in most cases for the current practice of closing down facilities in the evenings and during the long vacation periods. In the absence of compelling extenuating circumstances, new construction should be deferred until full utilization of existing capacity, including facilities under construction, is reached.

Because personnel remuneration is the largest single item of education costs at all levels, changes in how teachers and nonteaching staff are paid and employed could be an important element of any strategy to contain recurrent costs. Recent experience has demonstrated that in some countries there is a large payoff to purging from the educational payrolls so-called ghost teachers—those who are not actually assigned to classroom duties or are not fulfilling their assigned duties. There likely remains a significant potential to be exploited in this sensitive area, at least within the primary and junior secondary subsectors.

Everywhere, reductions should be pursued in the typically high numbers of nonteaching staff in African secondary and, especially, tertiary education institutions. Students should be given significant responsibility for performance of essential instruction-related custodial and administrative support services, as has been discussed among the finance diversification measures. In addition, such categories of personnel as messengers, drivers, watchmen, stewards, and sweepers can usually be reduced without sacrifice of educational quality. But because salaries at this level are low, even very sharp reductions will have only a limited, although nonetheless positive, impact on unit costs.

Reduction of teachers' pay is also a policy option that should be considered in countries where it can be demonstrated that a sufficient supply of teachers of comparable quality would still be forthcoming. Inflation has undermined teachers' salaries substantially during the past two decades, as it has all public sector wages in the region. Even if it were politically feasible, further reduction in real rates of pay for teachers alone (in isolation from other civil servants) could lower the quality of education in some African countries. Certainly outright cuts in nominal wages

would appear to be undesirable everywhere because of the adverse impact on teachers' professional motivation and commitment. Nonetheless, the growing numbers of unemployed secondary school leavers and of university graduates and dropouts in Africa suggests a potential pool of labor with adequate motivation and intellectual skills for teaching; they ultimately may be prepared to accept wages somewhat lower than those currently prevailing in the teaching profession. This reduction in pay would be facilitated if certification requirements for the teaching profession were relaxed, a point closely related to entry qualifications, to which we now turn.

Although still difficult and controversial, another policy option, especially at the primary and lower secondary levels, is to reduce the minimum entry qualifications for teachers. If less preservice education and training were required of new teachers, they could be paid less than they must be paid under the existing compensation structure. Too many children in the world's least developed countries are denied access to schooling because their governments are trying to match the preservice educational requirements typical of the world's most developed countries. This denial of opportunity is unjustified for two reasons. First, marginally lower entry qualifications—for example, one or two fewer years of schooling and preservice training for those teaching the early primary grades—may not diminish what pupils learn in the classroom, especially in Africa today where the governing constraints on learning are the lack of instructional materials and lack of effective time on task. Second, given the relative costs of providing preservice and in-service teacher training and given the salary structures that prevail in most places, in-service training is usually the more cost-effective means of raising the quality of classroom instruction. For primary school teachers especially, many African countries should consider imposing further limitations on the quantity of preservice education and training, and coupling this with a policy of frequent in-service courses to upgrade and refresh teachers' skills, with particular attention given to subject-matter competency and the proper use of instructional materials.

More intensive use of teaching staff is potentially the most fruitful approach for reducing unit recurrent costs. Savings are possible so long as the increase in teaching time is greater than the increase in salaries needed to motivate and compensate the teachers for their greater effort—that is, so long as teachers can be induced to accept some reduction in hourly wages in the context of an increase in their total earnings. Even in the absence of other measures affecting teachers' compensation, the more intensive use of teachers as teachers (as distinct from implicitly condoning their performance of other activities, such as tending to the family farm or small business) may allow unit costs to be reduced.

As indicated in chapters 4–6, many options can be explored to make greater use of teachers. They include lengthening, through a variety of schemes, the teachers' (but not the students') school day; holding classes six days a week in primary schools that do not already do so; increasing the teaching hours per week in secondary and tertiary institutions to levels more closely approaching norms outside Africa; reducing vacation periods so that teachers (and facilities) are employed much more than the thirty-six weeks a year now common; and increasing the minimum number of students in a class, especially in secondary and tertiary institutions where courses are often thinly subscribed. In addition to all such measures, each of which would result in some modest reduction in unit costs, most developing countries, if they aspire to bring about nonincremental changes in educational access over the next several decades, will need to consider some fundamentally different alternatives for the delivery of educational services (see the discussion below on extramural study programs).

An analysis of tertiary education in Africa leads to a special conclusion about the utilization of teachers at this level. For reasons discussed in chapter 6, it would be desirable in most African countries to stabilize or even reduce the number of university students in the short term (that is, the next five to ten years). This adjustment would be achieved by contracting relatively low-priority faculties (for example, arts and law) and by consolidating the number of institutions and academic programs within a country or across several small countries. This contraction and consolidation would allow for a substantial improvement in the use of facilities and the size of classes in core programs on the consolidated campuses, thereby increasing the productivity of the teaching personnel employed there. A painful—but absolutely necessary—concomitant of this adjustment measure in higher education will be reductions in faculty numbers beyond what would occur through normal attrition. Substitution of African academics for expatriate professors will in many fields make it possible to avoid dismissing currently employed teaching staff. However, in selected disciplines in arts and humanities, where overproduction of personnel trained at the tertiary level is most severe, the redundancy of African teaching staff is inescapable and must be squarely faced.

Revitalization: Restoring Quality

The second dimension of an education strategy for Africa involves revitalizing the infrastructure now available for education and training in order to restore and improve quality. The focus should be on the fundamentals: instructional materials, academic standards, and the maintenance of equipment and physical plant. Students and teachers waste their time (at great cost) for lack of textbooks and other learning materials and for lack of effective examination systems to set and maintain standards. School supervision systems, vital to education performance, come to a halt when there is no money to operate vehicles or pay for telephone and other communication services. In addition, buildings and equipment deteriorate for lack of maintenance, and expensive laboratories are not used for lack of reagents and spare parts. These items of nonsalary recurrent expenditure have been highly vulnerable when budgets had to be cut, even though they amount to only a small fraction of total education expenditures. Appropriate balance in the use of inputs must be restored immediately. If efficiency and quality in education are to be achieved, systematic and sustained measures to revitalize the existing infrastructure are essential supplements to adjustment policies.

Instructional Materials

The top education priority in Africa today is to ensure that every child in every classroom has access to the pedagogically necessary minimum of instructional materials. What that means in pratice will of course be different for the several levels and within levels will vary by grade and subject. Methods of production, distribution, and finance will also vary from country to country. But only those countries that accord central importance to the provision of instructional materials can be judged to have put in place adequate strategies for educational development.

Difficult issues will have to be confronted: what pedagogical material to develop locally and what to purchase from abroad; whether to purchase higher-cost local printing or least-cost printing elsewhere in the region or, more usually, outside Africa; and how to make the best use of nontraditional media such as radio. In a recent policy paper on education, the African Development Bank emphasized the importance of considering instructional materials within the overall context of restoring nonsalary recurrent expenditures to adequate levels:

> The supply of appropriate teaching materials is particularly inadequate in large parts of Africa. While this is to some extent a question of finance, the issue of producing and distributing adequate teaching materials for African schools goes much beyond the question of funds. As there is an urgent need not just for any teaching materials and textbooks, but for materials that are more closely in tune with the realities and needs of African societies, a major field of lending activity opens up here. Bank Group loans will support, not just some of the technical assistance needed in modifying and adapting existing textbooks and materials and preparing new materials, but also the production and distribution of these materials in Africa. Educational Resource Centers in areas where there is a particularly serious shortage of instructional materials could be another example of this general thrust. In this area of quality and internal efficiency, as the majority of the nonsalary inputs have a direct effect on the qualitative aspects of education, the Bank Group will give priority to [helping] regional member countries identify and maintain minimum standards for nonsalary inputs. (African Development Bank 1986, pp. 15–16.)

Academic Standards

The restoration and clarification of standards of academic performance are key to improving the quality of education at all levels. Academic expectations for students and schools should be high, and they should be clear. By providing signals on performance to which teachers, students, and parents can respond, the examination system is both a measurement and incentive device that should be used explicitly to raise academic standards. But to perform this function, most African examination systems need to broaden their tests to sample the full range of cognitive competencies sought by the nation from a given level of the education system. Now the tests often concentrate narrowly on those skills most needed for success at the next level. If examinations were more broadly structured, they would be more pertinent for assessing the skills of the majority of students who will not advance to the next level.

Operation and Maintenance of Physical Plant and Equipment

Preventive maintenance and repair of physical plant and equipment, another item of nonsalary recurrent expenditure, is an essential ingredient for revitalizing

African education systems. Quality education is just not possible in laboratories and workshops that have no electricity or water because wiring, fuses, and plumbing have deteriorated, and where equipment does not operate because spare parts and consumable supplies are lacking. Maintaining door and cabinet locks, replacing broken windows, repairing leaky roofs, changing the oil and filters in heavily used field vehicles—these may be simple things to do, but they are not getting done. Failure to do them means that vital equipment is not available and functioning when needed, and unit costs are inflated when premature replacement is the consequence.

Once plant and equipment are restored to fully functional status and their maintenance attended to on a routine basis, money is also needed to ensure that these resources do not sit idle. Reestablishing adequate budgetary provision for such simple items as gasoline, postage, and telephone service is essential if school supervision systems at the primary and secondary levels and fieldwork at the tertiary level are to make their intended contribution to educational productivity.

Selective Expansion

The third dimension of an overall strategy for education and training in Africa entails the considered and deliberate expansion of selected education services. Public support for the sector has been threatened recently, and will continue to be threatened, by the fiscal austerity that grips the region. Wise leaders, however, will do what they can to protect from debilitating cuts those long-term education investments that promise the most for their nations' future.

Most forward-looking education programs, although they will differ from one African country to the next, will need to put some emphasis on each of the following: renewed progress toward universal primary education; new programs of extramural study at secondary and tertiary levels; development of a broadly based system of training; and improvement of graduate education and research capacity.

Safeguarding the quality of instructional staff will be essential at all levels during any selective expansion and will require special attention. Motivated, knowledgeable, and pedagogically competent teachers are essential components of educational quality. The revitalization efforts described earlier focus on eliminating current constraints on teachers' effectiveness, such as the shortage of instructional materials. But beyond such efforts, as selective expansion again becomes economically feasible to encourage, African education systems will need to provide for constant professional renewal of the teaching force, particularly if the standards for teachers' years of preservice education are relaxed in order to contain costs.

In order to maintain the quality of instructional staff, the design and implementation of cost-effective systems of continuous in-service training for primary and secondary school teachers should be part of every country's education policy package. This training should focus on upgrading and updating teachers' knowledge of subject matter and mastery of improved pedagogical methods embodied in widely available instructional materials. Distance education is likely to be the most attractive delivery mode for much of this activity. Furthermore, teachers' progression through the salary scale should depend on their successful completion of such regular in-service courses, thereby ensuring that pay is more closely related to potential classroom productivity than it is now. For the tertiary level, much on-the-job professional improvement can be achieved in the short run by reestablishing the flow of standard textbooks, new monographs, and journals, but ultimately the upgrading of teacher quality will entail increased investments in formal postgraduate education.

Renewed Progress toward Universal Primary Education

For many countries, the most important long-term investment—in both its economic and social returns—will be to renew, after adjustment and revitalization measures have begun to take hold, national progress toward universal primary education (UPE). Renewing progress toward UPE will inevitably require the mobilization of substantial new resources, including—but not limited to—increased commitments of public resources. Chapters 2 and 3 showed how costly and difficult is the task of merely keeping up with population growth. Yet, two lines of evidence suggest that in many countries very high priority should be accorded to the goal of continued progress toward UPE, while in a few countries universal provision of nine years of education may already be an appropriate goal. First, compared with projects and investments in other sectors, investments in education have an unusually good record of implementation and sustainability; absorptive capacity has been demonstrated. Second, there is strong (and mounting) economic evidence indicating high returns to investment in education, particularly primary education.

Those returns will be greatly attenuated or never materialize at all if the incidence of disease and malnutrition among young children goes unchecked. Policy packages for educational development must consider

how to ensure not only that pupils are well taught but that they are teachable, a point of increased importance since serious nutritional deprivation has become a perennial problem in many parts of Africa. However, the links between child health, nutrition, preschool intellectual development, and attendance at and performance in school are particularly complex and only imperfectly understood. Regional and international collaboration in the search for more complete answers offers the best hope of developing practical policies to remedy the situation.

Distance Education Programs

New extramural study programs are perhaps the only viable way to address the massive problems of access to secondary and postsecondary education for students and to continuing education for teachers. Accreditation examinations allow certification of an outside student's "equivalency" to having completed a conventional program. Students can thus acquire diplomas and degrees by independent study, typically guided by correspondence materials supplemented by radio broadcasts. The replicability of high-quality teaching materials allows high performance standards to be set and maintained in the equivalency system. Moreover, by their very nature, equivalency programs tend to favor the most persistent and motivated students. Often extramural programs actually use existing campus facilities during evenings or vacation months for tutorial sessions and laboratory work, although sometimes equivalency education takes place in specially created institutions.

The unit costs of instruction in extramural programs are typically only 20 percent to 40 percent of the unit costs of conventional instruction. In addition, there are often substantial savings in student transportation and (public budget) savings in living costs. During the present period of adjustment and austerity in Africa, a country's rationale for incurring the high construction and incremental costs of the "bricks and mortar" approach to educational expansion deserves to be scrutinized.

Training

Occupation-specific training is essential for African development. The question is not whether to train, but rather when, where, and how to do so in the most cost-effective way. Experience suggests that African policymakers, like their counterparts in other parts of the world, may be tempted to adopt questionable policies by the undeniable urgency of the need for occupation-specific skills. As summarized in chapter 5, there are numerous pitfalls to be avoided, but only a few bedrock principles upon which wise policymakers can rely for guidance.

One such principle is that formal schools are, generally, neither the only nor the best place in which to train students in most specific vocational skills. With the possible exception of some commercial skills (such as typing and accounting) that have wide applicability and low requirements for expensive equipment and facilities, vocational training is best provided after students have secured initial employment. And it is best conducted in venues closer to the workplace and more directly under the control of employers than are formal schools. The emphasis in Africa should be to design for each country a system of vocational training founded on this principle.

This difficult task will be greatly facilitated by ensuring that there is a single place in the government—and not necessarily, or even desirably, in the Ministry of Education—that is charged with formulating, monitoring, and evaluating training policy. In this process, macroeconomic policies that stimulate provision of job-specific training—in such areas as wage regulations, investment codes, tax incentives, and apprenticeship rules—have a crucial part to play and should be prominently included in an overall policy package for improvement of education and training.

Meanwhile, the education systems of most African countries already include schools whose mission is to provide occupation-specific training for agriculture, industry, and the services. These schools must be encouraged to operate as efficiently as possible, even while other, fully coherent training systems are being developed. Typically, a great deal can be accomplished by ensuring that expensive facilities and equipment are fully utilized, curricula are maximally responsive to the (often changing) skill requirements of employers, and teachers are well endowed with real-world experience in the jobs for which they provide training.

Research and Postgraduate Education

The adjustment and revitalization measures for tertiary education proposed in this study will, when implemented, go far toward addressing problems related to the efficiency and quality of undergraduate programs. But better undergraduate programs, in themselves, will not increase Africa's scientific and technological self-reliance in the next century. Ultimately, Africa will continue to develop only to the extent that it can take advantage of the worldwide explosion of knowledge and itself generate knowledge pertinent to African problems. These functions

require Africa's top intellectual talent: the people with master's and doctoral degrees whose careers are in university teaching and research and in the most sophisticated knowledge-intensive scientific and technical positions in government and the private sector. In fields central to African development, such as agriculture, health, engineering, and management, and in the basic natural and social sciences that underlie applied work in those areas, the continent must intensify efforts to develop its own capacity not only to produce these people but also to sustain professional environments in which such highly specialized talent can be productive.

Thus the questions arise whether, when, and how Africa can develop, in a few institutions of higher learning, programs of postgraduate education and research training comparable in quality to the best available outside the continent. Can African postgraduate education be expanded and upgraded to produce a substantial fraction of the continent's top professional talent and more research of the highest international standards? This question (like the one mentioned earlier about the importance of childhood nutrition and health for learning) is unfortunately one in which the dimensions of the problem are far more clearly defined than the solution.

Nonetheless, the solution is of critical long-run importance to all countries, although none can reasonably address it alone. Given the continent's limited resources and the unavoidably costly sums required to ensure high-quality efforts, international cooperation—among African countries, and between them and their partners in other regions of the world—to establish a coherent set of programs of excellence in national institutions will have to be central to any solution. Country-specific policy packages for educational development should include practical mechanisms for encouraging and effectively supporting regional and international initiatives to address such transnational issues.

Policy Design and Implementation

For most African countries the formulation of a comprehensive educational development program, derived from a balanced package of policies for adjustment, revitalization, and selective expansion, will be a new experience. Each country will organize for the task in its own way. In many countries, however, a fruitful approach to policy design might include the following: establishing a national commission with political clout to oversee the work; constituting a technical staff to support the commission; drawing for both upon the best political judgment and analytical talent of ministries of finance and planning, as well as education, and of the nation's institutions of tertiary education and research; building a national consensus through provision of ample opportunity for public debate on emerging findings and recommendations and on their rationale; and taking advantage of the experience of other African countries in formulating educational development strategies.

All such activities would, of course, need to be financed. Budgetary resources would have to be sufficient to cover not only the personnel costs of such a national commission and its staff but also their operating expenses for travel, communications, publications, and specialized contractual services (such as data collection and processing, expert technical consultants, and targeted research or analysis).

Although careful elaboration of education development programs is urgent and essential, the impact of such programs will ultimately depend on African capacity for implementation. Thus improvement in education management is a necessary concomitant to policy reform and must be given immediate and continuing attention.

The most important measures to improve management involve the potential returns to downward and outward delegation of various administrative functions. Some functions, of course, must appropriately remain within the central ministry, and the performance of these functions will need to be improved. The toughest challenge to improving management, however, lies closer to the classroom, at the level of individual schools and districts. African policymakers should consider how, with adequate safeguards against abuses, headteachers and the local communities they serve can be given greater authority in the acquisition and use of the resources essential to effective classroom teaching and learning.

In addition, central ministries must tend more seriously to their own management development needs, especially in the areas of performance monitoring and policy planning and analysis. Improvements in examination systems (which were already mentioned with reference both to academic standards and to distance education), in the nature and timely availability of statistical and financial accounting information, and in the numbers and qualifications of staff engaged in full-time analytical work are among the necessary measures. Incentives in many ministries of education are insufficient to attract, motivate, and retain able staff. Governments committed not only to the formulation of an educational development program but also to its expeditious implementation will have to address imaginatively the issue of incentives at all levels of the education system.

IMPROVING THE EFFICIENCY OF EDUCATIONAL SYSTEMS

INDICATORS OF EDUCATIONAL EFFECTIVENESS AND EFFICIENCY

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CHAPTER TWO

DEFINITIONAL AND METHODOLOGICAL ISSUES RELATED TO THE CONCEPT OF EDUCATIONAL EFFICIENCY

The purpose of this chapter is to provide an introduction to the nature of the concept of efficiency, as currently used by most economists, and the advantages and disadvantages one encounters in applying the concept to an activity as internally complex and contextually diverse as education. In this chapter, a set of definitions will be established that will serve as the basic terminology used in the subsequent discussion of specific indicators of educational effectiveness and efficiency. The discussion will introduce the four major forms of efficiency analysis applied to education: benefit-cost, cost-effectiveness, cost-utility, and least-cost models will be presented. The chapter will conclude with a review of five major limitations that exist in attempts to apply the economists' models of cost and productivity to education.

It is surprising to most non-economists to learn that the concept of efficiency is, in fact, a relatively new emphasis within the lexicon of economics. Schumpeter's History of Economic Analysis (1966), the standard for the treatment of the development of Western economic thought, has not a single index reference to efficiency. Part of the reason for this earlier lack of overt attention was that the efficiency concept was implicit to the market models developed by Western economists from the late 1700s up to the 1930s. Only in the last fifty years has great attention been directed toward issues of measurement and empirical testing of the deductively derived theories of neoclassical economics (Johnson, 1975).* The result of this new emphasis on quantification has been to raise the issues of the operationalization and measurement of the economic variables. The economist no longer can be satisfied simply to state that under a given budget, efficiency exists, for a producer when the marginal cost of an output from a production process equals the output's marginal revenue product or for a consumer when the ratio of the marginal costs of all consumption items to their marginal utility are equal. Without debating the contribution that these abstract models (and the neoclassical insistence upon defining equilibria as optima) have had for understanding social and market phenomena, there has been a recognized need to produce a practical and adaptable form of efficiency that can advance the management of private and social enterprise.

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* Schwartz and Berney (1977) offer an excellent set of discussions dealing with the neoclassical economists' approach to the efficiency concept.

Chapter 2

The economic concept of efficiency is a metaphor borrowed from engineering relationships. In any technical process efficiency is defined as existing where the desired mix of outputs (effectiveness) is maximized for a given level of inputs (cost) or where inputs are minimized for a desired mix of outputs. It is important to recognize from these definitions that the concept of effectiveness (how well or to what extent the desired outputs are achieved) is subsumed in the concept of efficiency (effectiveness relative to cost). In the following sections of this monograph, the term effectiveness will be used when indicators represent outputs or output proxies (input or process variables and outcomes) and efficiency when the indicators represent a comparison of effectiveness with costs. In all cases efficiency is a more inclusive term and implies both effectiveness and cost considerations.

If the definition of efficiency is specified in terms of physical quantities only, one has a definition of technological efficiency. If one modifies the concept to take into account utility* or monetary measures, a definition of economic efficiency is derived. Economic efficiency is defined as existing when the value of all outputs is maximized for a given cost of all inputs or where the cost of all inputs for a given value of all inputs. Both of the efficiency concepts, technological and economic, appear both rational and intuitively obvious. What is less obvious is how to measure inputs and outputs so one may know when efficiency exists and, in the case of economic efficiency, to know what values (costs or prices) to assign to inputs and outputs to avoid biasing the identification of efficiency.

In a competitive market situation all firms must strive to achieve efficiency because the inability or unwillingness to do so will mean that their competitors can charge lower prices and drive the "inefficient" firms out of the market. Efficiency in a competitive market is therefore a self-monitoring and self-equilibriating process. Since firms in a competitive market are, by definition, small relative to the total market, the individual firms have no effect on the cost of inputs or the prices of their products. Thus, economic efficiency can be defined in a non-arbitrary manner.

Unfortunately for those who prefer objective, mechanistic decision processes, the conditions of the competitive market are increasingly rare in general and simply do not exist in regard to the education and training systems of most nations. As will be developed here, the abandonment of the competitive assumptions does not reduce the importance of the efficiency concept; however, it does force those who wish to use it to

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* The economic concept of utility is dealt with at a later point. For the moment it is necessary to understand only that utility refers to perceived satisfaction or happiness.

deal with less than ideal proxies for their conceptual variables and to accept subjective responsibility for judgments concerning the values of inputs and outputs.*

In almost all situations, education in developing nations is either a monopoly function of government or else government exists as a major financier and regulator of the educational activity. In shifting from the model of a competitive market to one of a bureaucratic management or regulatory system, one loses the self-monitoring and self-equilibriating characteristics that assured efficiency in the competitive situation. To replace them one must turn either to legal rules or bureaucratic incentives that are designed to achieve an approximation of efficiency.

Some economists and many non-economists have questioned the propriety of transposing the efficiency concept from a technical setting to a social or behavioral one (Klees, 1984). A more appropriate question might have been whether it is possible and justified to transpose the concept of competitive efficiency to a non-competitive context. It is clear, however, that regardless of the philosophical uncertainty over the propriety of this transposition, the last ten years have seen a rapid escalation in attention paid to efficiency issues related to educational finance and management; and this increased attention has occurred in both socialist and market economies.

If the result of this increased attention to efficiency is that more and or better educational benefits are obtained for a given level of expenditure then the use of the efficiency concept will be justified. If the result is hat educational planners and managers use economic models and jargon as a shield for their biases and subjective judgments, then the use of the efficiency concept will not have served a legitimate purpose. It is important to understand that the efficiency concept is a neutral device; it is the definition and valuation of its components (inputs, processes, outputs, and outcomes) that will determine whether the current attention focused on efficiency is a positive or negative contribution to educational development.

In proceeding to establish a basic glossary of efficiency terminology, it is useful to discuss the concepts of production and utility that underly the practical discussion that follows. This discussion of theory is presented as a foundation for the later practical discussions. While it is possible for one to benefit from the subsequent practical discourse without an understanding of this theoretical foundation, one cannot claim to

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* Klees (1984) asserts that the requirement that market prices reflect efficiency is similar to the econometric condition that regression coefficients represent causal impact. He notes that "... both necessitate the fulfillment of relatively few, but totally unattainable, conditions and both have little practical guidance to offer on how inaccurate these indicators are when the necessary conditions do not hold..."

understand the efficiency issue fully without an appreciation of the concepts of production and utility.

The production process for education, for which the major factors are depicted in simplified form in figure one, consists of four main parts: inputs, process, outputs, and outcomes, In figure one examples are given of the types of observable and measurable variables that may be classified as belonging within each stage. Inputs are the resources used in the production activity: for educational production, inputs may be divided into the general categories of student characteristics, school characteristics, teacher characteristics, instructional material and equipment characteristics, and facilities characteristics. In each case the term "characteristics" refers to the availability of a resource, its nature and quality, and its manner and rate of utilization.

For example, an important teacher characteristic would be the teacher's mastery of the subject matter (e.g., mathematics) for which the teacher is responsible. The effect of teacher subject matter competence on the education production process will depend on the existence of some measurable level of competence; its nature (the areas of mathematics skill mastered) and quality (the degree of competence); and its manner and rate of utilization (the means by which a unit of teacher time or effort is combined with other resources including student time and effort).

The process stage of educational production refers to the means by which educational inputs are transformed into educational outputs. Often the term educational technology is used to refer to a specific process for promoting educational outputs; examples of educational technologies are classroom lecture/discussion, small group instruction, individual student-teacher tutorial, self-study with traditional textbook or textbook-derived materials, and self-study with programmed instruction. Recently, these traditional technologies have been supplemented by radio or television instruction within the classroom, more sophisticated audio-visual equipment, and computers. These latter teaching-learning processes are the ones that are more "technological" but the term "technology" may refer to all forms of the educational process.

The interaction of inputs and process determine educational costs. Ideally, educational managers should be able to design the instruction/ learning system by considering alternative inputs and processes simultaneously. However, the reality is that in most developing nations serious limitations exist in terms of the availability and quality of inputs and over the range of practical and affordable technologies (Thiagarajan, 1984; Cummings, 1986).

FIGURE ONE

MAJOR FACTORS IN THE EDUCATION PRODUCTION PROCESS

DETERMINANTS

INPUTS	PROCESS
Student Characteristics	Forms of Instructional Organization
Teacher Characteristics	Alternative Technologies
School Characteristics	Use of Teacher and Student Time
Instructional Materials and Equipment Characteristics	
Facilities Characteristics	

EFFECTS

OUTPUTS	OUTCOMES
Cognitive Achievement	Employment
Improved Manual Skills	Earnings
Attitudinal Changes	Status
Behavioral Changes	Attitudinal Changes
	Behavioral Changes

The predominance of teacher-centered lecture/discussion as the means of educational technology is neither an accident nor a result of unfettered choice. Rather, this mode of classroom instruction has emerged because, first, many educational budgets must allocate 80% or more of expenditures to teacher salaries (with a substantial portion of the remainder used for system administration) and, second, because teacher-student ratios are such that a lecture format is seen by most teachers as the only means by which the teacher can deal (in terms of instruction and discipline) with the large number of students for whom they are responsible. While most teacher training systems advocate greater use of small group and individual instruction, the teacher's own classroom experiences as a student and the reality of classroom management demands often dictate against all but the most highly structured, teacher- centered forms of classroom organization. Also, given the high rate of incidence of unqualified or underqualified teachers in some educational systems, reform of the teacher-centered instructional process, which may threaten the security of the existing teacher corps, is unlikely to occur without substantial external pressure.

A danger of the economic production metaphor is that it tends to imply that the technology used is rigid and constant and that the inputs are standardized and independent. Because the education process deals with human factors, all of these implications are unfulfilled to some degree. It is not just that variety (perhaps extensive variety) exists among the inputs of teachers, students, schools, and materials, and the way they are combined; the individual human and material inputs also may vary over time. The motivation and effort of the teacher may fluctuate day to day or even within a given day; the attentiveness and effort of students is a notoriously variable commodity. The interdependence of the variables is indicated by the fact that one of the explicit responsibilities given to teachers is to monitor and motivate the behavior of the students; a similar indication of interdependence of inputs is the finding, common to the research literature, that student peer influences have a substantial moderating impact on student behavior and accomplishment (Winkler, 1975; Webb, 1982; and Nielsen, 1982). At least in part, these interaction effects can be controlled for by the introduction of interaction terms in the quantitative specification of an education production function.

Thus, this abstraction of reality from the conceptual form of production must be recognized but it does not destroy the value of the production metaphor for understanding educational behavior. For example, in some classrooms it will be the practice of the teacher to spend extra time with the slower learning students while allowing the faster students to work on their own with textbooks or other materials. This is a decision that potentially is supportable from the economic theory of production. The teacher is operating on the belief that the marginal value of a unit of his or her time is more valuable to the slower learning student than to the more advanced student. Even if the advanced students would learn more from the teacher than from study on their own, the

greatest relative productivity advantage lies from combining the teacher input with the inputs of the disadvantaged students.

Unfortunately, detailed microeducational analyses to support such teacher decisionmaking are almost never done. Classroom observation studies are the only practical means for developing the appropriate data for such analyses and such ecological studies of the school are time and labor intensive and suffer from their own set of serious methodological limitations as well as the obvious question as to generalizability. However, if classroom-level studies face serious limitations, as to method and relevance, the same can be said for the survey approach to analysis of educational production and efficiency. The survey collection of data on inputs and outputs from a large number of schools assumes implicitly that the individual classrooms are using the same instructional technology when classroom observation studies often suggest this simply is not so (Thomas and Kemmerer, 1983). The survey approach may be more acceptable in developing nations where, as noted above, variation in formal classroom organization and process often is more constrained. However, in this setting the problem of proper specification and measurement of the variables, and internal variation within a defined variable, may be even more of a problem than in a developed nation setting.

To this point, the discussion of educational production has emphasized only inputs and processes (technologies). These two factors will determine the cost of education since total cost is equal to input unit costs (cost per teacher-year or textbook) multiplied by input quantity (number of teachers or of textbooks).

One of the major confusions concerning the efficiency concept is the belief that it is synonymous to lower costs. In a case where excessive expenditures and waste exist the two may be achievable simultaneously. However, where more costly inputs exist that have proportionally even higher productivity, the achievement of efficiency could be used to justify greater unit costs. In every case, cost considerations are only one part of the efficiency calculation.

As indicated earlier in figure one, the effects side of the efficiency equation involves both outputs and outcomes. Outputs are the direct and immediate effects of the educational process. They include cognitive achievement, manual skill development, attitudinal changes, and behavioral changes. In aggregate measurement one is concerned not just with measures of the central tendency but also distributive parameters. The latter are used in judging the equity or fairness of the educational system. Comparisons of such measures as student means and standard deviations among socioeconomic, ethnic, locational, or other classifications and between the gender groups is another method used to judge whether education has an ameliorating, neutral, or reinforcing effect on initial social disadvantages of given groups.

Ideally, cognitive, manipulative, attitudinal, and behavioral measures of outputs should be highly differentiated by specific subject areas, skills, attitudes, and behaviors. The common situation is that these measures are available only for certain general cognitive areas (verbal and mathematics) and often not available at all in the areas of manual skills, attitudes, and behaviors.

In addition to the differences noted above, outputs tend to be less subjectively measured than are outcomes. The types of cognition, manual dexterity, attitudes, and behaviors purposefully promoted by the school are generally a product of governmental if not public consensus. The larger social outputs are more controversial both because they are less directed in their production and because they often involve the manifestation of unauthorized if not unacceptable views and behaviors.

The difference in the degree of subjectivity is not absolute since considerable debate can and does exist about what the school produces, whether the production is "purposeful," and how to value it. The tendency to value educational outputs in terms of how they promote desired economic development outcomes has been one of the most controversial areas. Whether these development outcomes occur within market or statist economic systems, there is a legitimate question of whether other outcomes of education have not been unduly neglected in favor of this single indicator of educational effectiveness.

Outputs, when compared to educational costs, can be used in measuring internal efficiency is a measure of how well the educational institution or system achieves its stated goals; it is calculated by the ratio of output to cost. If both output and cost can be quantified in monetary terms a benefit/cost ratio can be derived. To be efficient the benefits must exceed the cost (i.e., the benefit/cost ratio must be greater than 1.0). In comparing educational activities in the absence of practical budget constraints, the activity with the higher ratio of benefits to cost is preferred.

If the effects of an activity cannot be stated in monetary terms, it is possible to derive a cost-effectiveness ratio; however, the measure of effectiveness must still be quantifiable (even if only in an ordinal form). For example, a study might show that an additional five dollar per-student expenditure on instructional materials will increase measured achievement by ten percent while a similar expenditure on instructional radio increases achievement by only seven percent. In this example, the instructional materials alternative would be the more cost-effective.

One weakness in many educational innovation projects is that the efficiency comparison is made only between the individual innovation (additional educational materials or radio instruction, for example) and the traditional classroom practice (lecture/discussion without instructional support materials or radio instruction). In the

example presented above, both systems might be judged cost-effective compared to the traditional classroom; however, the relatively less cost-effective radio alternative might be selected for implementation if it were the only instructional alternative to the traditional classroom for which a cost-effectiveness comparison were made. Thus, the usefulness of cost-effectiveness analysis may be seen as a function of the analyst's thoroughness in selecting options for evaluation.

A second methodological problem is that some cost-effectiveness comparisons fail to consider the consequences of expending an equivalent additional sum per-student on the traditional classroom alternative. Legitimately, no objective comparison of cost-effectiveness can be made unless either the cost or effectiveness standard is fixed. For example, one can compare the efficiency of the traditional classroom with an instructional innovation if one has the same cost for both; in this case the difference in measured effectiveness alone will determine the more efficient alternative. Similarly, if the effectiveness standard is fixed (e.g., a five percent gain in measured achievement), it is possible to compare the costs to see which instructional system requires the least expense to generate the identified level of effectiveness.

However, if neither costs nor effectiveness can be fixed for the two alternatives, it is not possible to use the mechanistic criterion of cost- effectiveness. Rather, a cost-utility comparison must be made. An example would be where there are two innovations with data available as indicated below:

	Additional Cost Per Student	Average Percentage Increase in Achievement
Innovation A	$10	7%
Innovation B	$15	10%

In this example, it would be fallacious to consider the relative cost-effectiveness ratios of $10/7% and $15/10%. The fallacy exists because the fractions do not contain a common numeric (unit of expression in quantitative terms) and because one cannot assume that the cardinal value of $1 per student is either equivalent or consistently proportional to the value of a 1% increase in achievement.

Judgment in such a case must be made based on the subjective valuation that the decisionmaker assigns to the measures of costs versus the measures of effectiveness. One person may feel that it is worth the additional $5 per student to gain another 3% in achievement and thus would favor Innovation B; a second person might disagree and feel

that Innovation A is preferred and the additional cost of $5 per student is not justified to produce "only" another three percentage point gain in achievement. Of course, it is also possible that a third person may feel both innovations are too expensive and would oppose the adoption of either one. The argument would be that the subjective value of increased achievement is simply not worth the additional expenditure.

When one considers the fiscal effect of multiplying a small increase per student times all of the students in an educational system, it is easier to understand why educational innovations have such a history of disappointment in terms of system-wide adoption or adaptation within developing nations. The advocates of specific innovations, in addition to being guilty of certain evangelical excesses in ignoring other innovative alternatives, often fail to collect the data or institute the social marketing practices (Middleton, 1986)--including incentives--that will convince parents, practitioners, and policymakers that the positive effects of the innovation are worth the financial expense (and the non-monetary costs that may be incurred in terms of the disruption of traditional classroom and bureaucratic practices).

The final form of efficiency analysis is least-cost analysis. It involves the lowest level of conceptual sophistication of any of the analytical models for measuring educational efficiency. It assumes that the desired outputs are fixed (but not necessarily quantifiable) and requires only that evidence be presented that the proposed means of producing the outputs is the least costly alternative available. The most common use of least-cost analysis is in the determination of the feasibility of project designs. In such a situation, a judgment must be made that the probable effects of the project will justify the educational intervention and the probable costs of the intervention are the least expensive means of producing the desired effects.

All of the approaches to efficiency evaluation mentioned here are generic to project or program analysis and are not limited to the evaluation of educational activities.* The application of these approaches to the appraisal or evaluation of educational activities has been more controversial than in such areas as transportation or infrastructive development. Health and population activities are an exception in that efficiency analysis has been at least as controversial there as in education. Education, health, and population activities share an immediacy in their effect on human lives and an inherent subjectivity in terms of external and collective judgments of their benefits and costs. The controversy has been aggravated by a tendency of some efficiency proponents to misrepresent the degree of objectivity implied by the use of efficiency criteria such as benefit/cost ratios and cost-effectiveness comparisons. The fact remains that as long as

* More extended discussion of these issues may be found in Donohue, 1980; Levin, 1983; Ray, 1984; and Woo and Sanders, 1986.

educational demands exceed available resources, rationing of educational opportunity in access and quality terms will be required. Increased efficiency, therefore, will remain the only means of expanding access and/or quality without new resources and the best means of assuring that new resources that are made available are used to maximize their impact on access opportunity and quality enhancement. The efficiency analyst can help provide the most current and accurate information obtainable to assist the decisionmaker in promoting access, equity, and quality enhancement goals.

A special aspect of the efficiency controversy is the difficulty of shifting from the analysis of internal efficiency to the analysis of external efficiency. While disagreement may and does exist over the degree of determinacy of educational inputs for educational outputs, the difficulty of relating the immediate effects to the investments made in education are much less than in attempting to relate the more distant educational outcomes. The long term effects that one normally considers as educational outcomes are such things as lifetime earnings, the probability of employment, occupational attainment, social status, political participation, consumption and savings patterns, and a variety of attitudes and behaviors.

Two main difficulties exist in relating educational inputs to such educational outcomes (that is, in the measurement of external efficiency). The first difficulty is determinacy (imputing the causal effect of education) and the second is discounting for time preferences. The latter problem exists because educational expenditures that are investments in future outcomes require an immediate financial sacrifice in return for a future benefit that may be delayed for a considerable time.

The concept of time preference is well established in behavioral psychology and economics. Two primary reasons are given for a preference for immediate versus postponed benefits: the first is the risk that a benefit delayed may not be received or not received in full and the second is the demonstrated preference of individuals for immediate over delayed (but otherwise assured) consumption. Mortality, changes in educational qualification requirements,and other changes in the labor market relating to salaries and job security make it exceedingly difficult to predict the future earnings, employment probability, or status for any given level and type of education graduate.

When dealing only with financial outcomes such as earnings it is possible, through discounting, to compare monetary values across time. A unit of currency at any future time may be equated to a current unit of currency values by the following formula:

$$PV = \frac{FV}{(1 + i)^t}$$

where: PV = present value
FV = future value
i = rate of discount;
and t = number of time periods

Thus, if the future value is $100 and the rate of discount is .10 (10 percent) per time period and the future value is received five time periods into the future the formula becomes:

$$PV = \frac{\$100}{(1+.10)^5} = \$62.09$$

Thus, $100 received in five years is equivalent to receiving $62.09 today if the rate of discount is ten percent. The rate of discount incorporates the effect of anticipated inflation plus other calculable risks involved in postponing receipt of funds. Because of psychological and other differences among persons, individuals' subjective rates of discount may differ substantially. The present value of benefit/cost then is exactly the same criteria as the normal benefit/cost criteria but with the important exception that the values of benefits and costs have been adjusted by discounting to take into account when the benefits and costs occur over time. An alternative to the present value of benefit/cost criteria is the rate of return approach that will be discussed in detail in the later section on efficiency criteria. The present value formula may be modified to calculate the sum of the present values of a series of different future values that occur over a number of time periods (for example, expected annual earnings over a period of years):

$$PV = \sum_{t=1}^{N} \frac{FV_t}{(1+i)^t}$$

where n = the total number of time periods.

While the discounting process is apparently objective, its mechanistic nature disguises the problem of obtaining the appropriate estimates of the future values and the difficulty of selecting the appropriate rate of discount. The future earnings for a certain type of educational graduate may be forecast based on current earnings patterns and expected labor market changes--this is a process fraught with the opportunity for substantial error. Also, fifty years ago, the rate of discount was considered relatively uncontroversial because lending rates for "riskless" government bonds (the normal basis for determining the opportunity cost of the time delay) were relatively standardized and tended to be stable over time. In the current capital markets of most nations a plentitude of rates may exist without clear criteria (such as varying maturities or risks) to justify selection of a single discount rate and, more importantly, the fluctuation in rates over time may be expected to be much more substantial due to variations in the expected rates of inflation.

These difficulties make the calculation of present values of educational outputs difficult but still feasible if done on a relatively frequent basis and if one can avoid making substantial fixed investments on the basis of present values that may change significantly over time. The latter caveat is important but often ignored in educational planning decisions. Where possible, educational investments should be of a type where fixed facilities and equipment are avoided or minimized and, again, where possible, subject to alternative uses if future conditions no longer justify continuing a project or program.

The areas of secondary and post-secondary vocational training or technical education are excellent examples of where this logic can be applied. The demand for vocational skills may fluctuate greatly over time and, within a single economy, specific skills may be subject to saturation in supply in a relatively short period of time. For example, if there is a need to produce a total of 1,000 electricians over the next five years one might create a training program that would produce 200 graduates per year. The problem is that at the end of the fifth year the demand for electricians may be satisfied but the training program will still exist. Educational systems have had little success in closing programs once they are initiated. Ideally, the original program plan should have presented efficiency data to justify the production of the 1,000 graduates but also should have provided an analysis of how the program could be phased down, converted, or terminated once the justified number of graduates were produced.

An important reason for the growing emphasis on the use of industrial sites for training activities is that, in addition to providing access to more current technology, the main cost of equipment is for the purposes of production, not training. Therefore, the efficiency analysis requires only that there be sufficient benefits to justify the proportion of equipment and facilities costs allocatable to the training activity rather than the total of such costs.

The preceding discussion has concentrated on the issue of production. Because both outputs and outcomes of education are multiple, and even some individual outputs and outcomes must be valued subjectively, the economic concept of utility must be discussed. Consumer utility may be defined as the pleasure or satisfaction a consumer expects to receive from consumption of a product or service. When the "consumer" is in fact a bureaucrat or other policymaker, their utility ideally should be inclusive of judgments about the probability of consumer satisfaction on the part of the individuals affected by their judgment. For example, an educational planner's decision will be based upon his or her personal utility but also on the degree of responsiveness of the planner to perceptions of the utility of the parents, teachers, students, and others affected by the decisions made.

In the simplest case, where only two outputs exist, utility maximization will be achieved by considering the value of the two outputs and the resource constraint on output production. While mathematically the problem of maximization of utility increases as the number of output choices is expanded, the fact is that the human mind (and now, computers) can handle the optimization process quickly. The main constraints the educational decisionmaker faces are the paucity of knowledge about alternative costs, about the nature of relationships among outputs, and about the time preferences of those affected by the decisions made. Some outputs--such as verbal ability and certain forms of disciplinary behavior or obedient attitudes--may be joint outputs. This means that the process of producing one output can produce the other output at no additional cost. Other outputs may be mutually exclusive at the margin. That is, one can produce more of either output but not more of both. An example would be that one may not be able to produce greater achievement by the most advantaged students and increase achievement equality for the class at the same time.

The task of educational managers (in fact, of all managers) is to understand the production process well enough to be able to identify which outputs are independent, which are joint outputs, and which are mutually exclusive outputs. Then, the educational utility decision requires combination of this knowledge of the production process with an understanding of the appropriate values to be assigned to the outputs so that a decision can be made that will maximize the utility to be derived from the mix of outputs that are to be produced.

There is an unfortunate tendency for politicians and even some senior educational administrators to act as if the educational production process can be expanded (in terms of the number of outputs and/or the amount of the individual outputs produced) without providing new resources or incurring any sacrifice in existing output production. Implicitly, they are assuming that the current educational process is inefficient (probably true) and can be changed by administrative fiat (probably false). Unfortunately, even if

the administrators were fully correct, administrative decrees rarely produce new outputs without reducing others. The demand for new or better outputs may be achieved by sacrificing some existing outputs that could be more highly valued. In addition, the new demands may overburden the process (especially the teacher's class management skills) in such a manner that overall production of outputs is reduced. Too often ignored, both in economic theory and administrative procedures, is the fact that those directing the educational production process at the classroom, school, and even system level are individuals who rarely have received management training concomitant with their management responsibilities.

A final item of terminology needs to be reviewed before proceeding from this discussion of the concepts of production and utility to their application to effectiveness and efficiency analysis in schools and school systems. A critically important term is that of the "margin." Frequent references refer to marginal cost or marginal productivity and it is common for economists to say that a certain condition (e.g., equilibrium or efficiency) exists "at the margin." The concept of margin is taken from the calculus and refers to a single incremental unit. For example, the marginal productivity of teacher time could refer to the increase in productivity that would result from one more hour of teacher effort. Similarly the marginal cost of teacher time could be defined as the expense of using the additional hour of teacher time. In theory, marginal units are assumed to be extremely small; in practice, one often is forced to work with units of substantial size (a person-month or person-year, for example). One can even consider the idea of a marginal school or marginal university if one is analyzing the effect of adding an additional institution to an existing system.

Five limitations exist in regard to application of basic productivity and cost relationships to education:

1. multiple inputs that must be determined simultaneously;
2. multiple output/outcome measures of productivity;
3. lack of information on costs and productivity;
4. fixed input quantities or relationships; and
5. variable input quality.

The problem of multiple inputs is one faced in almost all production situations but poses special problems in education. While economic theory stipulates productivity relationships under ceteris paribus conditions, the educational decisionmaker must determine the mix of inputs simultaneously. Teacher quality and quantity, availability and use of materials, equipment and facilities, and means for motivating student, parent, and community effort are some of the major input categories with which the decisionmaker must deal. One reason for the conservatism of educational systems relative to instructional change is that the decisionmaker always has to justify any new

input mix when, in fact, there are few data or experiences to support the purported effectiveness of the new input types or quantities. In addition, economic theory presents the productivity concepts in terms of a given technology. If the new input mix also involves a change in technology, it will be even more difficult to justify the instructional change on the basis of a priori quantitative data.

The second problem the educational decisionmaker faces is the valuation of marginal product. In addition to the basic problem of value judgment, the decisionmaker must identify and value the effect of the individual inputs on multiple outputs and outcomes. As discussed above in the description of utility analysis, multiple products can be dealt with but they add complexity to the analysis and heighten the implicit subjectivity of the valuation process. The decisionmakers need to know both the cost of inputs and the relationship (independent, jointly produced, or mutually exclusive) among the inputs and the mix of outputs and outcomes. In addition they must be able to assign a value to alternative output/outcome mixes. Obviously, most educational production decisions are made without all of this information; the goal of efficiency advocates is to increase the amount, quality, and timeliness of such information and to make the valuation process more explicit.

The third constraint on educational decisionmaking about production is the availability of information. Given the quantity of educational research of the last thirty years it is surprising how little is "known", let alone how little can be "proven" concerning educational production and efficiency. The next section of this monograph will discuss the various individual inputs, processes, outputs, and outcomes that commonly are proposed for education. Each will be reviewed in terms of what research has revealed, what deductive logic and experience can tell decisionmakers, and what can be done to increase the informational base for efficiency decisions.

The fourth specific constraint on educational decisionmaking concerning efficiency is the fixed nature of relationships that exist within the educational production process. These rigidities are not always technologically determined but rather are often a product of tradition, law, regulation, or contractual agreement. The most dominant of these rigidities is the central role for the teacher. The teacher's dominance in the classroom is an interesting example of tradition becoming institutionalized by law, regulation, and contract. Further, because of the low level of resources normally available for the classroom instructional budget, there is little ability in the poorer countries even to provide significant complementary inputs to reinforce the teachers' effectiveness, let alone to consider replacing the teacher as the major input.

The fifth major limitation on the use of economic production and cost concepts in educational management is the variability in the nature of the inputs. The major cause of this variability is the need to conduct management decisionmaking at an excessively

high level of aggregation (and often at a physically distant level of administration). The "teacher" input is an example of a variable that often contains substantial internal variation; in such a case the modal or mean characteristics of a group of teachers may not be a useful base for decisionmaking because of the large range and substantial variation that exist around these measures of central tendency. Even if one divides the excessively aggregated concept of the teacher input into its component parts--subject knowledge, experience, pedagogical skills, motivation, attitudes, and behavior--the problem of internal variation within the multiple teacher-input definitions still may be considerable.

This problem is at the center of the long-standing debate over survey versus observational collection of data with which to analyze education production relationships. While observational techniques provide more depth and detail in terms of measurement of the variables and their interaction, the observational approach itself has three major methodological disadvantages. First, observational measurement techniques are still in the process of development and controversy still exists over the specification and measurement of educational variables at the classroom and school level. Second, there is an unavoidable and explicit acceptance of subjectivity and variability in the measurement of inputs. An observer measuring time-on-task of students is forced constantly to make judgments of student behaviors as to whether certain actions are learning relevant or not. In addition, there is the fact that observed values will differ not just among observers but that the values of inputs assigned by a single observer can vary from situation to situation depending on the observer's attentiveness and diligence. And third, because classroom and school observational studies involve substantial cost in time and money, this methodology allows results of only limited immediate generalizability because the research budget rarely allows a statistically representative coverage of classroom or school settings.

The weaknesses of the observational methodology for analysis of educational production are no greater than those that exist for the survey methodology; however, because the weaknesses are more obvious (and the survey approach has tradition as an advantage) the observational methodology has been underutilized. The point must be made, however, that some educational production issues are researchable only by ethnographic methods including classroom observation. A major need is for economists and others interested in educational production relationships to develop a consensus as to the situations in which the survey or ethnographic approaches have a comparative advantage. This consensus could then serve as a basis for design of both educational management information systems and for a more comprehensive research agenda for the study of educational production and efficiency.

The limitations discussed here must be understood within the context of a more far-reaching limitation. Education's conservatism toward the application of efficiency concepts is simply a special case of the general administrative conservatism towards all

change. Unlike the case in the more progressive parts of the private sector, bureaucracies rarely offer incentives for managers to engage in change or experimentation and educational bureaucracies in particular often exert specific sanctions against innovation. In this context it is easy to understand why improvements do not occur even if understanding fails to reduce one's frustration with the process.

In this section an attempt has been made to accomplish two objectives:

1. familiarization of the non-economists with the basic economic concepts that support the measurement and analysis of educational efficiency, and

2. development of a standard set of terminology for efficiency analysis so as to minimize semantic confusion in the succeeding discussion.

Ideally, the purpose of a presentation such as this should be to simplify and clarify; to many non-economists the initial reaction to the preceding discussion may be that the whole area of educational production relationships now appears more complicated than before.

The reason for this is that the presentation of education as an input- output process analogous to other technical production relationships is simply wrong. While the input-output model may have great value as a metaphor to help the uninitiated gain some basic appreciation of educational production, understanding educational production relationships requires that one move to more complicated economic models (involving the complex relationships among multiple inputs, the consideration of variable technologies, and the subjective valuation of educational outputs and outcomes). But to be of any possible policy value, the economic models must be understood to provide only a framework within which behavioral psychology, pedagogy, administrative and management science, anthropology, political science, and information theory all must play important roles. Finally, one is left with the realization that all educational decisionmaking will take place without optimal information and will be performed by individuals who lack the ideal mix of personal and professional skills and experience.

But in this regard education is no different from the other social services; the point is decisions must be made and will be made. The function of the efficiency analyst is to improve both the decisionmaker and the decisionmaking process. Improved, not ideal, decisions are the only realistic and attainable goal.

Within this more restrained statement of the goal of education production analysis, one must face the fact that even improvement can never be certain. Production analysis for education remains limited by what is understood of the production relationships and what data can be generated (in a cost-effective manner) to support decisionmaking. In the

next section of the monograph, the purpose shall be to present what is known (or more correctly what analysts think is known) about educational production and efficiency.

While analysts should be modest about their level of conceptual or factual knowledge, they have no choice but to be relatively immodest in promoting the use of their knowledge by practitioners, planners, administrators, and policymakers. The cost, in financial and human terms, of erroneous educational policies is simply too great. The educational decisionmakers may choose to distrust or ignore the analysts' recommendations but it is crucial that the decisionmakers at least be exposed to them and allowed to consider them.

TAB 5

Guide to Additional Reading Materials

Country case studies and discussion papers are now available on education policy adjustment and tracking school-level effects of policy change.

Education Sector Policy Adjustment Strategy

- *Education in Sub-Saharan Africa: Policies for Adjustment, Revitalization, and Expansion.* World Bank, 1988.

- *Financing Education in Developing Countries: An Exploration of Policy Operations.* World Bank, 1986.

- *Analytic Tools for Sector Work in Education.* By Mingat and Tan, World Bank, 1988.

  Economic Adjustment and the Education Sector. Special issue, Institute of Development Studies Bulletin (forthcoming), University of Sussex.

Tracking Effects of Policy Change: School Quality and Efficiency

Indicators of Educational Effectiveness and Efficiency. By Douglas Windham, USAID Monograph, 1988.

- *Improving Efficiency of Educational Systems, Project Summary.* USAID and Florida State University.

Macro-Economic Policy Adjustment

World Bank Lending for Adjustment: An Interim Report. By Peter Nicholas, World Bank, 1988.

- *The Implications of Fund-Supported Adjustment Programs on Poverty.* International Monetary Fund, 1988.

World Bank materials are available from the Publications Office, 1818 H Street, N.W., Washington, D.C. 20433.

USAID Publications are available from the Office of Education, SA-18 Room 609, Agency for International Development, Washington, D.C. 20523.

• - Copies of Cover Page and Table of Contents follow.

Education in Sub-Saharan Africa

Policies for Adjustment, Revitalization, and Expansion

The World Bank
Washington, D.C.

Contents

Notes on the Data

Most of the discussion and all of the statistics about Africa in this study refer to just thirty-nine countries south of the Sahara, for which the terms Africa and Sub-Saharan Africa are used interchangeably. The appendix lists and provides comparative information on these countries.

"Dollars" means U.S. dollars.

"Billion" means one thousand million.

Financing Education in Developing Countries

An Exploration of Policy Options

The World Bank
Washington, D.C., U.S.A.

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Appendix Tables

Analytical Tools for Sector Work in Education

Alan Mingat and Jee-Peng Tan

PUBLISHED FOR THE WORLD BANK
The Johns Hopkins University Press
BALTIMORE AND LONDON

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IMPROVING THE EFFICIENCY OF EDUCATIONAL SYSTEMS

INDICATORS OF EDUCATIONAL EFFECTIVENESS AND EFFICIENCY

DOUGLAS M. WINDHAM

State University of New York at Albany

January 1988

The Florida State University
Howard University
Institute for International Research
State University of New York at Albany

United States Agency for International Development
Bureau for Science and Technology
Office of Education
Contract No. DPE-5283-C-00-4013-00

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Occasional Paper No. 58

The Implications of Fund-Supported Adjustment Programs for Poverty

Experiences in Selected Countries

By Peter S. Heller, A. Lans Bovenberg, Thanos Catsambas, Ke-Young Chu, and Parthasarathi Shome

International Monetary Fund
Washington, D.C.
May 1988

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The following symbols have been used throughout this paper:

... to indicate that data are not available;

— to indicate that the figure is zero or less than half the final digit shown, or that the item does not exist.

- between years or months (e.g., 1984–85 or January–June) to indicate the years or months covered, including the beginning and ending years or months.

/ between years (e.g., 1985/86) to indicate a crop or fiscal (financial) year.

"Billion" means a thousand million.

Minor discrepancies between constituent figures and totals are due to rounding.

PROGRAM AGENDA

Education Policy Adjustment: Improving Quality and Efficiency

A World Bank/USAID Conference

Monday, November 14

9:00 **Welcoming**
Co-chairs Aklilu Habte and Gary Theisen

Expectations for the Conference
Stephen Heyneman, World Bank
Charles Gladson, Agency for International Development

9:45 **Presentation 1** — Overview of Bank's Current Experience in Sector Lending
Wadi Haddad and Michael Wilson, World Bank

10:15 **Roundtable discussion**

10:30 **Coffee Break**

10:50 **Presentation 2** — Ghana's Policy Adjustment Experience
Vida Yeboah, Deputy Secretary, Ministry of Education and Culture

11:20 **Discussion:** Led by L.B.B.J. Machobani, Minister of Education, Kingdom of Lesotho

12:00 **Lunch** (at the World Bank)

1:40 **Presentation 3** — Tracking Policy Change and School Quality: Cases of Somalia and Liberia
Fran Kemmerer, State University of New York

2:10 **Discussion:** Led by Kenneth Tsekoa, Principal Secretary for Education, Kingdom of Lesotho

2:40 **Presentation 4** — Malawi's Policy Adjustment Experience
Edward Ngaye, Ministry of Education and Culture

3:10 **Discussion**

3:40 **Summary comments**

4:00 **Adjourn for Day 1**

Tuesday, November 15

9:00 **Presentation 5** — Senegal's Policy Adjustment Experience
Birger Fredriksen, World Bank

9:30 **Discussion:** Led by Tesfaye Dubale, Ministry of Education, Ethiopia

10:15 Coffee and workgroup meetings

12:00 Reconvene
Outline plan for afternoon discussion and synthesis of lessons-learned

12:30 **Lunch** (at the World Bank)

2:00 **Roundtable reports from workgroups**
(remain at the Bank for afternoon session)

3:00 **Concluding summary comments**

3:30 **Final adjournment**