

PN-ABQ-959

Lessons Learned

IN BASIC EDUCATION
IN THE DEVELOPING WORLD

An A.I.D. Workshop



The Office of Education
Bureau for Science and Technology
U.S. Agency for International Development
Washington, DC

1990

PW-ABQ-959

Lessons Learned

**in Basic Education
in the Developing World**

The Office of Education
Bureau for Science and Technology
U.S. Agency for International Development
Washington, DC
1990

Foreword

On February 15-16, 1990, the Agency for International Development (A.I.D.)'s Office of Education, Bureau for Science and Technology (S&T/Ed) convened a workshop to analyze important experiences in improving basic education. During this two-day forum, representatives from 16 institutions and donor agencies consolidated lessons learned from research and operational experience over the past decade. Although individual project results are often disseminated through conferences and publications, this workshop represented A.I.D.'s first attempt to extract lessons learned and disseminate them collectively to others.

This monograph is another step in that direction. Included within these pages are major conclusions in four key areas: girls' education, strategic planning and management improvement, instructional technologies, and teacher training. Most of the findings were shared at the February forum. All are based on projects currently being implemented in developing countries.

Although the monograph primarily addresses A.I.D.-funded projects, the research findings included do not represent positions of A.I.D. Rather, the findings represent the lessons learned by technical experts who have worked--or are working--in the field and have arrived at these conclusions as a result of first-hand program design and implementation.

S&T/Ed would like to see these hard won lessons put into practice. At the same time, we recognize the need for decisionmakers to be sensitive to the specific conditions in their countries that will affect the applicability of various strategies. The summaries included are not intended to provide sufficient detail for utilization. They are intended to be a stimulus for accessing the original body of information and a catalyst for designing new interventions. To that end, I encourage you not only to read this document, but to review the references listed and contact the project presenters and staff (listed on the last pages of the monograph) for more information. This office also stands ready to provide information and welcomes dialogue with interested parties.

S&T/Ed's goal is to build educational practices on a solid base of empirical research. In reviewing these lessons learned, I hope that others will be strengthened in their efforts to improve educational opportunities for children throughout the world.

*Clifford H. Block
Senior Scientist and Deputy Director
Office of Education
Bureau for Science and Technology
U.S. Agency for International Development
Washington, DC 20523
August 1990*

Acknowledgements

Many people made this workshop and publication possible. I offer sincere thanks to the presenters, respondents, and workshop participants listed at the end of the monograph; the hundreds of people throughout the world who have carried out the work summarized here; and those who helped develop the workshop, notably Gary Theisen, Jim Hoxeng, and Antonio Gayoso. I particularly want to acknowledge the exceptional effort of Dr. Murray Simon in organizing the workshop.

My thanks also to Creative Associates International, Inc.—May Rihani, Derry Velardi, Desiree deGraeve, Cynthia Prather, and Elisabeth Hudgins—for their help in organizing the workshop and for producing the monograph.

Final thanks go to my valued colleagues throughout the U. S. Agency for International Development.

C. H. Block

Table of Contents

<i>Foreword</i>	<i>i</i>
<i>Acknowledgements</i>	<i>ii</i>
Quality Basic Education for Women	1
Benefits of Basic Education for Girls	3
Expanding Access for Girls	5
Recruiting and Retaining Female Teachers	7
Improving Girls' Retention	8
Improving Facilities and Learning Materials	11
Strategic Planning and Management Improvement	13
Information Systems	14
Automated Data Collection	16
Automated Testing	17
Sector Assessments	19
Influencing Change through Research	21
Instructional Technologies for Improving Learning and Access	23
Interactive Radio and Achievement	24
Reaching Remote Areas with Radio	27
Interactive Radio for Health	28
Computer-assisted Instruction and Basic Skills Improvement	29
Low-cost Electronic Learning Aids	31
Audioconferencing and Distance Education	32
Effectiveness of "Programmed Teaching"	33
Textbooks and Academic Achievement	34
Making Textbooks Appropriate	37
Teacher Training	39
Effective Teacher Training	41
Increasing Access to Teacher Training	42
Alternative Teacher Training	44
Radio for Teacher Education	47
Training for School Principals	49
<i>Summary</i>	<i>50</i>
<i>Presenters and Respondents</i>	<i>52</i>
<i>Workshop Organizers</i>	<i>53</i>
<i>Workshop Participants</i>	<i>54</i>
<i>For Additional Information</i>	<i>57</i>

Quality Basic Education for Women

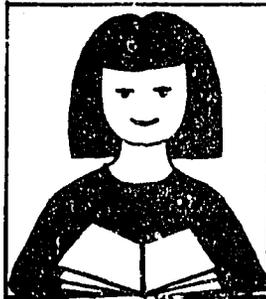
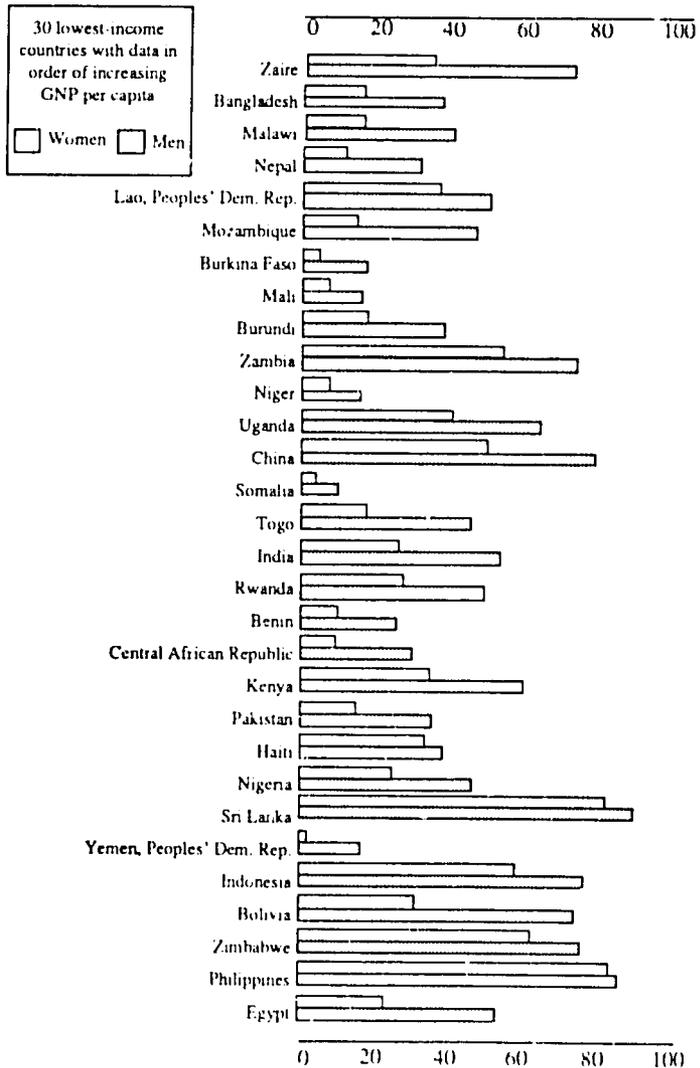
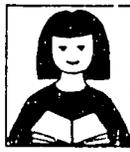


FIGURE 1
Men's and Women's Literacy in Poor Countries



Source: King, E. (1990). *Educating Girls and Women: Investing in Development*. Washington, D.C. The World Bank.



Benefits of Basic Education for Girls

Research Finding

Basic education, especially for girls and women, improves health and productivity. The poorest people benefit most.

Comment

Evidence from Third World countries shows a close link between women's education and development. For example, a World Bank study (King and Hill, in press) of about 200 countries shows that nations that invest heavily in female primary education benefit through lower infant and maternal mortality, longer life expectancy for both men and women, broader knowledge of good nutritional practices, and lower fertility rates than countries that do not achieve as high education levels for women.

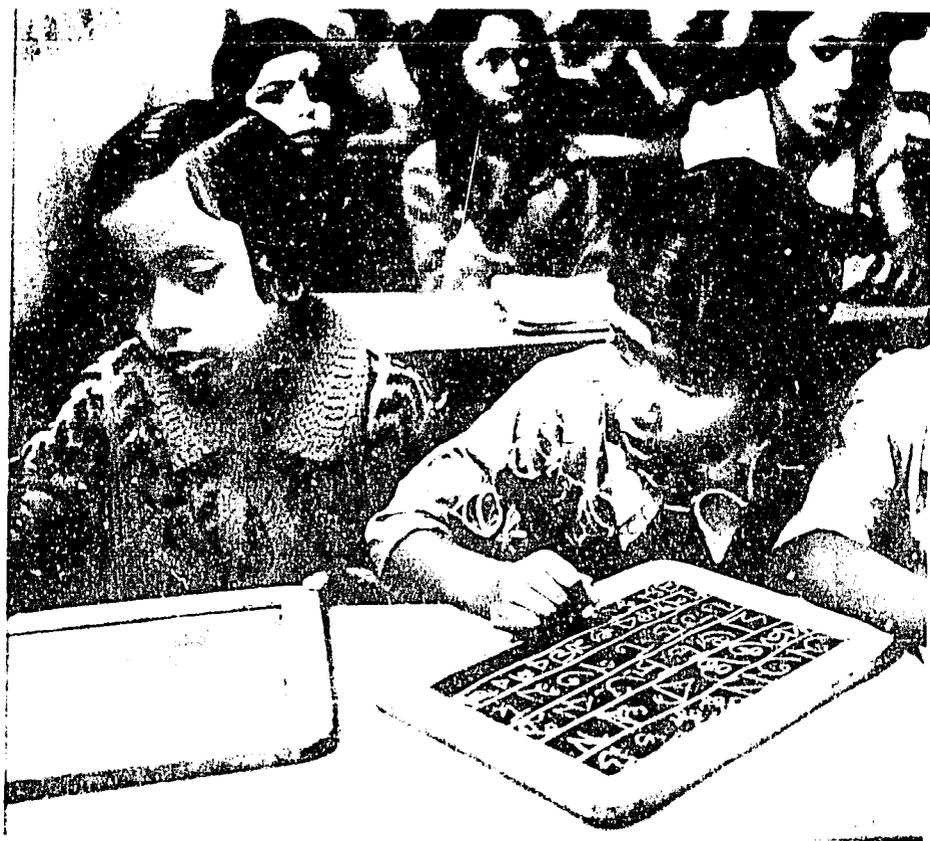
In addition, female education contributes to economic development through its positive effect on family income. A study of the productivity of men and women farmers in sub-Saharan Africa, for example, found the gain in productivity from education to be larger for women than for men. In wage employment, the returns to education can be as large or larger for women than for men. As women gain more access to better employment opportunities, their families benefit through improved consumption. Education also makes women better mothers. Better educated mothers are more likely to raise children who are healthier, more likely to stay in school longer, and quicker to learn. The children in turn benefit more from education and skills training, earn more, and be better able to use and create new technologies.

Finally, education empowers women to exercise their rights and responsibilities as citizens of their society, and enables them to make more efficient choices. Evidence shows that there is a relationship between national development and the size of the gap between male and female education. The World Bank study (King and Hill, in press) found that a country with a large gender gap, measured as the ratio between past male and female enrollment rates, will have lower economic production than another country with the same amount of capital stock and labor force but a smaller gender gap in education. In addition, between two countries with similar per capita income and patterns of expenditures in the social sectors, the country with the larger gender gap will experience worse indicators of social welfare.

The education gender gap is generally widest in the poorest countries. As reported in the same World Bank study (King and Hill, in press) women's literacy rates in the 30 lowest income countries based on GNP per capita averaged 20 percentage points lower and were as much as 43 percentage points lower than the men's literacy rates. Poorest countries may benefit more than other countries by educating girls and women. A second implication is that a country with a wide gender gap would have to raise per capita income more than a country with a small gap in order to achieve similar levels of social well-being.

References

- Kelly, G.P., and Elliott, C.M. (Eds.) (1982). *Women's Education in the Third World: Comparative Perspectives*. Albany, NY: SUNY Press.
- King, E., and Hill, M.A. (Eds.). (In press). *Women's Education in Developing Countries: A Review of Barriers, Benefits, and Policy*. Washington, DC: The World Bank.
- Smock, A. (1981). *Women's Education in Developing Countries: Opportunities and Outcomes*. New York: Praeger Press.



Girls and boys practice new literacy skills together in India.

Credit: The World Bank



Expanding Access for Girls

Research Finding

Experimental projects that widen school access are yielding some success.

Comment

Although the number of schools in the Third World has expanded greatly in the past 25 years and admission restrictions against girls at the primary school level have been relaxed, a larger proportion of school-age boys than school-age girls still enter and remain in school in many developing countries. The complex web of social and economic factors, including traditional roles of men and women, the limited supply of schools for girls, and the smaller financial rewards for women after graduation act as significant social and economic deterrents. Parents who are aware of the potential long-range benefits of education may, nevertheless, be unable to afford the tuition, materials, transportation, boarding fees, and other costs associated with sending girls to school.

Because the issue of girls' education is influenced by so many factors, past experience has shown that simply expanding access by building more schools, relaxing admission policies, or instituting quotas for female students does not bring about the desired increases in primary school enrollment. At where the family's demand for girls' education is low. To be effective, expansion policies must be accompanied by policies that overcome some of the other identified barriers.

Several countries have experimented with creative, low-cost strategies for bringing schools within walking distance of home. Bhutan initiated "feeder" or satellite schools that girls can attend for the first two to three years of primary education. These feeder schools are located in remote, rural areas some distance from the regular, complete primary schools. Preliminary data from these schools show higher enrollment and retention of girls. Bhutan encourages feeder school pupils to continue in the more distant primary schools by providing dormitories for feeder school graduates.

Bangladesh and Liberia are expanding school places within existing regular schools through multi-grade teaching and learning using programmed materials. These approaches are designed to maximize the use of classroom space and the limited number of teachers, particularly in rural areas where both resources are scarce.

References

- Begum, K.; Akhtar, S.; and Rahman, S. (1988). *An Evaluation of BRAC's Primary Education Programme*. Dhaka, Bangladesh: Institute of Education and Research (mimeo prepared for The World Bank).
- Kelly, G.P. (1989). *International Handbook of Women's Education*. Westport, CT: Greenwood Press.
- King, E., and Hill, M.A. (Eds.). (In press). *Women's Education in Developing Countries: A Review of Barriers, Benefits, and Policy*. Washington, DC: The World Bank.



Rural communities boost the female teacher supply using local training programs.

Credit: Anonymous



Recruiting and Retaining Female Teachers

Research Finding

Training and posting female teachers close to home works best for retaining them in the profession.

Comment

The absence of female teachers in rural schools is a barrier to girls' enrollment, particularly in countries where religion requires seclusion of women and parents allow girls to attend only single-sex schools with female teachers. Yet in low-income countries, only one third of primary, less than one-fourth of secondary, and just over one-tenth of tertiary education teachers are women.

Rural areas have other factors that exacerbate this overall shortage of female teachers. Women teachers from urban areas are generally reluctant to work in rural areas. Candidates from rural areas are scarce since rural women usually do not qualify to enroll in teacher training schools in the cities. In addition, programs in rural areas to identify, recruit, and train girls to become teachers are few. Although some countries have provided various incentives and have actively recruited girls from rural areas for teacher training, evidence suggests that these strategies are unlikely to attract even motivated teachers to these remote areas.

Pakistan and Nepal have developed a strategy that has proven successful in boosting the female teacher supply. This strategy involves placing teacher training institutes in rural areas, actively recruiting females from the particular area, and, after training, placing those graduates in schools near home. Girls who do not satisfy the entry requirements for the schools are first provided with training to satisfy those requirements.

References

- Ankrah-Dove, L. (1982). "The Deployment and Training of Teachers for Remote Rural Schools in Less Developed Countries." *International Review of Education* 28(1), pp. 3-27.
- King, E., and Hill, M.A. (Eds.) (In press). *Women's Education in Developing Countries: A Review of Barriers, Benefits, and Policy*. Washington, DC: The World Bank.



Improving Girls' Retention

Research Finding

Scholarships and other incentives that assist parents in meeting the cost of girls' education are important factors in retention.

Comment

Textbooks and other school-related expenses can be prohibitive to parents. However, *scholarship programs that provide direct assistance to parents can be a strong incentive for parents to educate daughters.* In Guatemala, where only about half of school-aged girls attend school and 17 percent complete the cycle, a pilot scholarship program was very successful. This program, which was begun in one Indian village and was quickly expanded to 12 villages, was also used to discourage early marriage and teen pregnancy. By 1988, the families of 600 girls between the ages of 7 and 15 enrolled in grades 3-5 had received a payment of US\$4 per month for each daughter who did not become pregnant and who attended school at least 75 percent of the time. Over 90 percent of the scholarship girls completed the year.

Begun in 1977, Bangladesh's program experimenting with scholarships to secondary school girls in the Sharasti Upazila area was also successful in attracting and retaining girls in school. This project soon expanded to five other areas. By 1988, more than 20,000 girls had benefited from the program. Evaluations have found that the program is widely received and supported. Female enrollment in project area secondary schools had increased from 27.3 percent before the project to 43.5 percent in 1987--more than double the national average. Girls who would have married in their early teens to avoid financial burden on the parents married at a much later age. In addition, when entering marriage negotiations, parents were able to negotiate lower dowries for more educated brides.

Countries have had success with a variety of other approaches to cut the cost of educating girls who otherwise would be caring for siblings, preparing meals, carrying water and firewood, and earning income from outside jobs. *Some 30 schools in Ghansu province of China allow girls to bring their siblings. A community day care program in Colombia has freed 200,000 girls and an equal number of women to attend school or work. The program will cover 1.5 million children by 1992.*

Labor-saving technologies lower the cost of girls' going to school. In Nepal, where females carry an average 7,000 pounds of firewood per year, *fuel efficient stoves shrank the amount of wood that needed to be carried by up to 40 percent. Flexible school schedules also minimize opportunity costs.* Colombia and El Salvador have divided their primary school curricula into small units so that students can learn at their own pace, taking time out of school to work in the fields, for instance, without losing their school standing. *Classes offered in the evenings provide a learning opportunity for those unable to attend any school.* In the Pune district of Maharashtra, India, classes were offered to 9- to-14-year-olds from 7:00 to 9:00 p.m. Girls, who were 1,040 of the 1,431 enrolled students, flocked to the program.

References

- Asia Foundation. *Yearly Follow-up Surveys*. Dhaka, Bangladesh: Asia Foundation.
Asia Foundation. (1977-1990). *Project Files*. Dhaka, Bangladesh: Asia Foundation.
Ather, A. (1983). *Evaluation of the Female Education Scholarship Program*. Dhaka, Bangladesh: U.S. Agency for International Development.

- Kabir, M., and Islam, M. (1985, 1988). *Bangladesh Contraceptive Prevalence Surveys*.
- Martin, L.G.; Flanagan, D.R.; and Klenicki, A.K. (1986). *Evaluation of the Bangladesh Female Secondary Education Scholarship Program and Related Female Education and Employment Initiatives* (report prepared for the Office of Population, U.S. Agency for International Development, Washington, DC).
- Thein, T.; Kabir, M.; and Islam, M. (1986). *Evaluation of the Female Education Scholarship Program*. (Study supported by the Asia Foundation.) Dhaka, Bangladesh: U.S. Agency for International Development.
- UNFPA. (1975). *Bangladesh Fertility Survey*. New York: UNFPA.



A teacher in Bangladesh helps her students review their assignments.

Credit: The World Bank



Improving Facilities and Learning Materials

Research Finding

Culturally appropriate facilities, materials, and activities boost enrollment.

Comment

The school environment has a stronger influence on girls' than boys' attendance. To ease parents' fears about their daughters' physical and moral safety, countries have experimented with building boundary walls around schools, providing closed latrines for girls, establishing single-sex schools, and actively recruiting and training female teachers. Anecdotal evidence shows that these safe, culturally appropriate facilities and the presence of female teachers remove disincentives for parents to enroll daughters.

Mosque schools were more attractive than regular primary schools to some parents in Mali, Pakistan, Bangladesh, and Kenya. These countries began supporting the accreditation of these more cultural facilities by introducing primary school curricula and trained teachers to supplement religious education. Girls' enrollment in such schools in Mali has grown quickly. Parents in Pakistan have not responded as enthusiastically however, possibly because mosque school education is perceived to be below the quality of government primary schools.

Information campaigns and nonformal literacy and skill training programs make parents more aware of the overall benefits of education and predispose them to invest in their daughters' education. In Morocco and Mali, for example, national media campaigns to bring attention to women's schooling are being launched. These campaigns stress the importance of literacy, numeracy, and other skills in finding employment and improving job productivity.

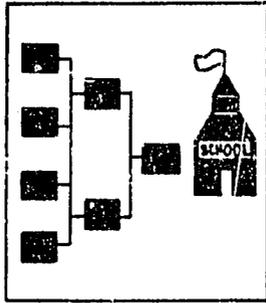
Responsiveness to parents' wishes that schooling be relevant to the everyday life of women can be increased by offering courses in domestic science, as in Mali where the government is revising the curriculum to include basic principles of health and child care. At the same time, there is a need to redesign the curriculum and textbooks to remove gender bias and make female role models more visible, as in Bangladesh.

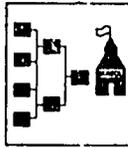
Making learning materials more easily available to girls and women also can improve school effectiveness. Evidence from Peru shows that the availability of textbooks and writing materials in primary school has had a larger impact on increasing girls' schooling than boys' schooling.

References

- Csapo, M. (1981). "Religious, Social, and Economic Factors Hindering the Education of Girls in Northern Nigeria." *Journal of Comparative Education*, 17, pp. 311-319.
- Eisenmon, T.O., and Wasi, A. (1987). "Koranic Schooling and Its Transformation in Coastal Kenya." *The International Journal of Educational Development* 7(2), pp. 89-98.
- Houghton, J. (1986). *Educational Finance and Reform in Mali*. Washington, DC: The World Bank.
- Kalia, N.N. (1980). "Images of Men and Women in Indian Textbooks" in *Comparative Education Review*, 24, pp. 209-223.
- Warwick, D.; Reimers, F.; and McGinn, N. (1989). *The Implementation of Reforms in the Primary Schools of Pakistan*. Cambridge, MA: Harvard Graduate School of Education (mimeo).

Strategic Planning and Management Improvement





Information Systems

Research Finding

When providing accurate and timely information, Management Information Systems (MIS) can help address a country's most pressing educational problems and can be an aid to better and more enlightened use of human and material resources for education.

Comment

According to Peter Drucker, management of education means doing the Right Things and then doing Things Right. MIS fails if it does not support both aspects of management. Failures also occur when computerized efforts at managing information are not appropriate for the needed information.

There are three types of information systems:

- *Statistical Information System (SIS)*. The SIS consists of historical information about an education system. The usual result of an SIS is an annual or biennial yearbook. Most countries have some type of SIS.
- *Management Information System (MIS)*. The MIS consists of systems (computerized or manual) that can provide *at least weekly information* on current activities in the areas of students, personnel, finances, and construction of an educational system. Some information is sufficiently current to allow managers to modify program activities. The usual results of an MIS are weekly, monthly, or annual reports for each area.
- *Decision Support System (DSS)*. The DSS consists of all the above, usually computerized which interconnects student, personnel, and financial systems and provides a manager with simulations and projections on the effects of a particular decision. *A DSS typically allows an education manager to estimate the effect of changing operations on the performance of the educational system.* The general result of a DSS is better, more thoughtful decisions based on current information. Few functioning systems in the Third World can be considered DSS.

Of the three possible systems, the most investment has been made in the SIS. The MIS and DSS, however, offer the greatest advantages to the resolution of the developing world's three major challenges:

- the expanding demand for education, because of burgeoning population;
- the eroding quality and equity in education, as systems have less and less financial and personnel resources; and
- decreasing teacher morale, largely because of declining respect for teaching.

MIS can support quality and equity in education by providing both monitoring statistics and data to support budget allocations. For example, in Thailand, a MIS linked to nationwide testing showed the extent to which achievement test results were dropping and the cost of correcting the condition. A five-year improvement effort was the direct result. In Honduras, MIS improvements highlighted a serious dropout problem and aided the government in correcting it over an eight-year period.

MIS can also be used to boost teacher morale by improving the services to them. A proper personnel and financial MIS ensures that teachers are evaluated, promoted, paid, and hired promptly and accurately. Valuable teaching time is gained for the whole educational system when teachers do not have to spend weeks at a Ministry of Education to resolve even the

most minor personnel issue. In some instances, payment delays for teachers can drop from three months to one day.

DSS can alleviate the pressures of the increasing demand for education by better predicting school enrollment and resources needed, which in turn can lead to better and more equitable allocation of facilities, teachers, supplies, and instructional resources. DSS assists in the political give and take that occurs between education and other social sectors. In Zimbabwe, for example, an early DSS assisted with first gaining and then allocating personnel and \$500 million in funds among nine regions and three million children (a 250 percent growth in four years) with minimal additional Ministry staff.

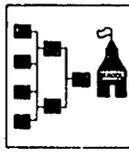
References

- Moses, K.D. (1990). *Creating Capacity for Educational Progress: Empowering the Education Manager*. Jomtien, Thailand: World Conference on Education for All.
- Moses, K.D. (1988). *Improving Educational Efficiency in El Salvador*. San Salvador, El Salvador: U.S. Agency for International Development.
- Theisen, G., et.al. (1988). "Computer Technology: Models and Educational Development." *Development Communication Report*, No. 61.



Education planners in Indonesia discuss sites for new schools.

Credit: A.I.D.



Automated Data Collection

Research Finding

The use of current, valid, school level data in the planning process increases school efficiency.

Comment

Virtually all public education systems employ procedures for collecting annual statistical data. However, in many systems such information is collected either too late to have a direct effect on public policy decision-making or effective operation, or is collected with little control over accuracy. In several African and Latin American countries, where school enrollment statistics are not available centrally for 14 to 18 months after the close of the school year, projections on teacher need are usually based on 2- to 3-year-old information. As a result, some schools must operate understaffed or with emergency allocations of personnel for long periods of time. In addition, many education systems collect and record data manually, a procedure that often presents problems with controlling accuracy.

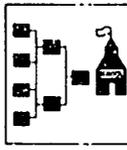
The outcome of both deficiencies is less reliance by key decisionmakers on data, and therefore, less accurate allocation of resources and less accountability for performance by individual school personnel. In systems where computer-based automation has been installed, however, information is more accurate, the processing of enrollment statistics is completed in 3-6 months instead of 14, and teacher requirements are known within 1 year--not 2 to 3 as before.

The amortized cost of improved data collection can be as low as 25 cents per student per year. In many systems this represents between .1 and .3 percent of the annual cost of educating students.

Data collection improvements can be easily made if the following elements are in place: a 3-5 year commitment to improvement from the Ministry of Education; an initial investment for needed computer hardware, software, and training; and managerial support within key operating units.

References

- Leslie, R.E. (1986). *Systems Analysis and Design: Method and Invention*. Englewood Cliffs, NJ: Prentice Hall.
- Moses, K.D. (1987). *An Automation Plan for the Ministry of Education and Culture*. Zimbabwe. Washington, DC: The Academy for Educational Development.
- Moses, K.D., et. al. (1988). *Improvements in Educational Efficiency for Basic Education*, El Salvador, Ministry of Education. Washington, DC: The Academy for Educational Development.
- Theisen, G. (1988). "Computer Technology: Models and Educational Development." *Development Communication Report*, No.61.



Automated Testing

Research Finding

Automated testing for basic education students dramatically increases the range of students who can be tested and substantially increases the speed with which test results are known.

Comment

In many countries, governments have encouraged national testing as a means to evaluate the performance of their students, provide criteria for selection of students for secondary education, and monitor the performance of the educational system. This, together with the dramatic increases in school enrollments, has resulted in overloaded testing facilities. In some countries, a student or parent may wait 4-6 months before test results are known. In addition, sometimes as many as 15 percent of all reported scores are either inaccurate or questionable. Inaccuracies in test correction have resulted in major political or civil disturbances in some countries.

In response to these problems, some countries have restricted the students who will be allowed to be tested, or in other cases have delayed the start of secondary schooling to accommodate late test results. The outcomes have been lost days of school, additional burdens on the educational system as administrators respond to parents' inquiries, and long delays for key decisionmakers interested in measures of educational progress.

Within the last decade, automated, computerized equipment has been both available and affordable for many countries. Using a variety of techniques--including optical scanning of tests (students answer by filling in a circle or bar), automated recording of scores by individual reviewers, and computer-generated test registration and logging--the number of students tested and the speed with which accurate results can be known has dramatically increased. *In Zimbabwe, the number of examination papers graded increased six-fold in 3 years, with a minimal increase in staff and a significant reduction in the processing time. In Indonesia, 6 million examination papers were processed and grades reported in less than 2 months, with an error rate of approximately .2 percent. In addition, overall confidence in the accuracy of the marking increased dramatically.*

Countries experienced in automated test correction report that the cost of such systems averages between \$.09 and \$.12 per student examination per year--including paper. As importantly, the automated correction process makes summaries, cross-year comparisons, and individual analysis of test results by school, district, region, or other category more easily available.

References

- Moses, K.D. (1988). *Scanning Applications in Zimbabwe*. (Presentation and paper.) Washington, DC: The World Bank.
- Moses, K.D. (1987). *Computer Applications for Development in Education*. Bangalore, India: American Association for the Advancement of Science.
- National Computer Systems. (1987). *Optical Scanning Applications in Several Countries*. Washington, DC: National Computer Systems.

FIGURE 2
Representative IEES Sector Assessment Outcomes

In Botswana:

Led to government-community partnership at junior secondary level

In Haiti:

Led to large education development project for private sector schools

In Indonesia:

Generated school quality study

Generated educational data management systems linked to policy alternatives at provincial level

In Liberia:

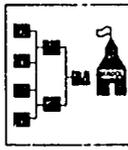
Advised the adoption of programmed learning/teaching system as national education curriculum

In Somalia:

Abandoned guaranteed employment for secondary school graduates

Led to civil service reform

Increased government investment in the education sector



Sector Assessments

Research Finding

Sector assessments, using a systems approach, are efficient and effective aids in planning for educational development.

Comment

Evidence from studies conducted under the Improving the Efficiency of Educational Systems (IEES) project between 1983 and 1987 shows that sector assessment, a tool for strategic planning, can bring about a variety of positive outcomes.

For example, in the years of work that followed a sector assessment in 1983, Botswana documented savings of at least \$3 million a year for primary education in the areas of teacher training and materials procurement. Other decisions and resource allocations were made in the areas of junior secondary education, vocational and technical education, private participation, and management. In the si: other countries where the sector assessment research was conducted--Haiti, Indonesia, Liberia, Nepal, Somalia, and the Yemen Arab Republic--significant changes were also found (See Figure 2).

Intensive efforts over several months can achieve high quality sector assessments that can do the following:

- help identify optimal investment opportunities for government and assistance agencies;
- provide better data by generating large quantities of information in one place in a structured fashion, and also by encouraging ministry staff to review and evaluate the data being collected and determine additional data needs;
- improve the efficiency of external assistance and the collaboration between the external assistance agencies; and
- provide rank-ordered policy options.

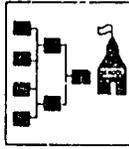
References

Sector Assessments conducted by the U.S. Agency for International Development's Improving the Efficiency of Educational Systems (IEES) project in cooperation with the following governments: *Botswana* (1984), *Haiti* (1987), *Indonesia* (1986), *Liberia* (1983), *Nepal* (1988), *Somalia* (1984), and *Yemen* (1986). Washington, DC: U.S. Agency for International Development, Bureau for Science and Technology.



Popular participation is vital to support for education and other development projects.

Credit: United Nations/Yutaka Nagata



Influencing Change through Research

Research Finding

Local research can significantly influence educational change.

Comment

Practitioners are likely to accept and respond to research findings if they define key issues and are full partners in the data collection and analysis. BRIDGES, an A.I.D.-funded project initiated to improve access by developing country planners, policymakers, and managers to information about the impact of alternative educational policies and programs, implemented several successful locally-based research activities.

In Burundi, for example, BRIDGES used a localized research approach to study the impact of language instruction in primary schools. As a result, the Minister of Education increased the number of years of French instruction as a second language. Officials also requested assistance in developing coordinated information systems across several ministries to improve planning and policymaking.

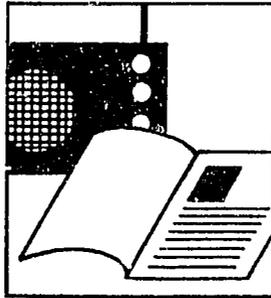
In Sri Lanka, where census data and principal responses from 273 randomly selected schools were used to determine factors affecting school-community relations, research findings provided the basis for region-specific program and policy recommendations. Recommendations that were well received included the adaptation of a more decentralized system for managing and sharing school resources and the improvement of the principal selection and training process. The project also built stronger relationships between the school and the community.

Policymakers and practitioners alike particularly appreciated the attention given at the school level, the indepth reports about what the schools were really like, and the responsiveness to the changing needs of their individual governments.

References

- Kularatne, N.G. (1989). "School Community Relations in Sri Lanka." *The BRIDGES Forum*, No. 7, p. 7.
- Management Systems International. *External Mid-term Evaluation of BRIDGES*. Washington, DC: Management Systems International.
- Nyaburerwa, B. (1990). "Problematic Aspects of Primary Education in the Context of Rural Development in Burundi." *The BRIDGES Forum*. No. 10, pp. 2-4, 7.

Instructional Technologies for Learning and Access





Interactive Radio and Achievement

Research Finding

The use of interactive radio instruction (IRI) in primary schools improves student achievement.

Comment

Over the past 16 years, interactive radio instruction (IRI) has proven to be highly effective in improving the achievement levels of primary school children in the core subject areas of mathematics, language, science, and health. Over 600,000 children in Africa, Asia, and Latin America are now benefiting from this low-cost intervention.

In-school interactive radio programs serve as an aid to the teacher and generally involve daily 20-30 minute radio lessons followed by a 15-30 minute teacher-led activity. The radio program is interactive in that every few seconds it prompts a student response--to answer questions, perform spoken or written exercises, or use simple materials. Many of the programs are accompanied by student worksheets. A short guide is provided to help teachers prepare for each lesson and to conduct postbroadcast activities. Complementary radio programs for teachers using the English, math, and science lessons are also being developed.

IRI incorporates fundamental principles of effective instruction: active participation, student feedback, distributed learning, reinforcement of correct answers, and systematic review.

In Bolivia, where IRI math programs will be available for grades 2-5 by 1991, the first evaluation shows that the grade 2 students scored 50 percent higher on tests over traditional teaching methods (see Figure 3). In Honduras, the evaluation of a new IRI mental arithmetic program for grades 1-3 demonstrates that IRI is capable of substantially extending the gains from introducing new textbooks. The addition of the radio programs in grade 1 nearly doubled the impact of adding textbooks alone. An evaluation of the same series in Costa Rica shows a major impact of IRI in rural schools.

In Africa, where the greatest interest in IRI is for teaching English, the Kenyan Radio Language Arts Project (RLAP) produced about a 40 percent learning gain over traditional teaching in oral comprehension, reading, and writing in grades 1-3 (see Table 1). These lessons have been adapted for use on a national basis in Lesotho and for new pilot activities in Swaziland and Belize.

In Papua New Guinea, students participating in a radio science project for grades 4-6 with two, 20-minute broadcasts per week have also showed significant achievement gains over the control classes in the grade 4 evaluation. In Bolivia, a pilot series for teaching health to children in grades 4 or 5 has shown positive results.

Low-cost adaptations and procedures have been developed to meet local cultural and curricular differences. Recurrent costs are estimated at \$0.50 to \$1.00 per student per year.

References

- Block, C. (1988). *The Use of Educational Technology in Basic Education* (Discussion paper.) Washington, DC: Office of Education, Bureau for Science and Technology, U.S. Agency for International Development.
- Friend, J.; Searle, B.; and Suppes, P. (1980). *Radio Mathematics in Nicaragua*. Stanford, CA: Institute for Mathematical Studies in the Social Sciences, Stanford University.

Lockheed and Hanushek. (1988). *Improving Educational Efficiency in Developing Countries: What Do We Know?* (World Bank Reprint Series, Number 435). Washington, DC: The World Bank.

Tilson, T.D. (1990). *The Economics of Radio Education* (paper presented at the 1990 African Conference on Radio Education in Harare, Zimbabwe.)

U.S. Agency for International Development. (1990). *Interactive Radio Instruction: Confronting Crisis in Education*. Washington, DC: Office of Education, Bureau for Science and Technology, U.S. Agency for International Development.

FIGURE 3
Bolivia Radio Mathematics
Grade 2

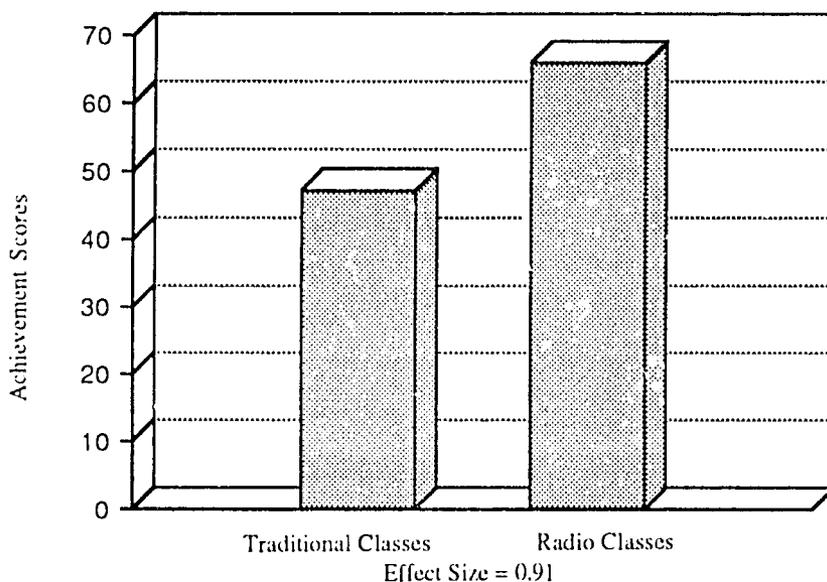
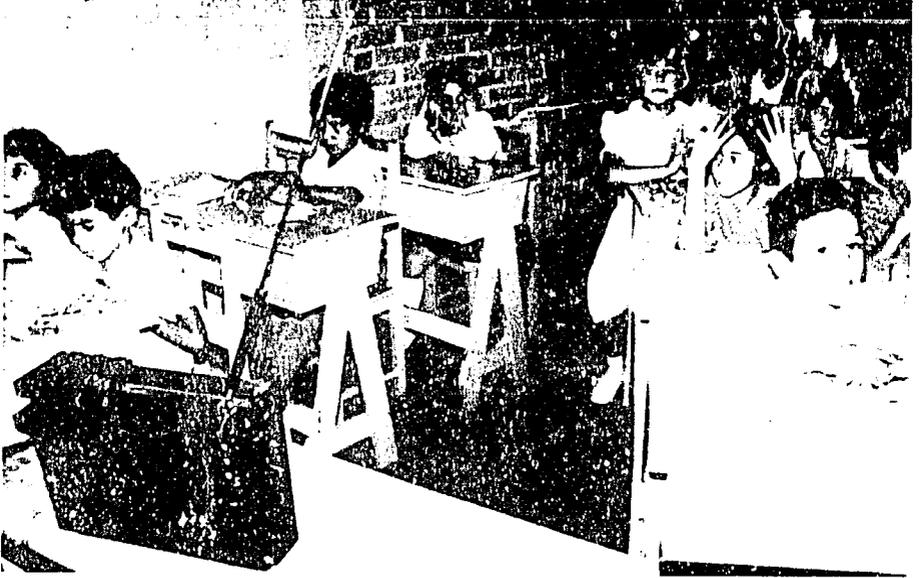


TABLE 1
Kenya RLAP Summative Evaluation Results

Grade	Reading		Listening		Writing		Speaking	
	Radio	Control	Radio	Control	Radio	Control	Radio	Control
1	41.5	36.3	68.0	51.8	No Testing		No Testing	
2	47.1	41.7	49.7	34.3	36.0	29.0	31.8	26.9
3	52.4	42.4	55.4	46.0	34.0	25.0	37.7	31.8



Children listen and learn from interactive radio instruction (IRI) in Honduras.

Credit: Thomas Tilson



Reaching Remote Areas with Radio

Research Finding

Children in remote communities receive good instruction at low cost through interactive radio instruction.

Comment

Interactive radio instruction (IRI) has been used since 1974 to teach primary education, generally to children in formal primary schools. In 1982, A.I.D. funded an experimental education project specifically intended to serve rural communities that have no formal schools and few qualified teachers. The Radio-Based Community Education (RADECO) Project in the Dominican Republic relies on radio to serve as a teacher.

Every day, children gather together at a community center or meeting place where, guided by a group leader drawn from the community, they participate in a one-hour radio lesson. These broadcasts provide instruction in mathematics and language, plus some topics in social studies and science. As with IRI lessons targeted to regular schools, the radio programs are based on proven principles of learning; they rely on a carefully designed curriculum and are scripted to actively involve the children in the learning process. Simple print materials are given to children to use during the broadcasts.

Evaluations show that children learn more math and about the same amount of reading and writing as children in comparable communities attending regular schools. If expanded to a large number of communities, recurrent costs would be about half that of the formal school system.

RADECO brings basic education to children in remote communities where schools may not be financially feasible for some time. Based on the program's success, the Dominican Republic institutionalized the program in 1986 and has expanded it as an official program of the Bureau of Education, Arts, and Culture to serve 82 communities in five provinces.

References

- de De Jesus, A.G. (1988). "RADECO: An Educational Alternative in the Dominican Republic." *Development Communication Report*, No. 63.
- Eshgh, R. et al. (1988). *Radio-Assisted Community Basic Education (RADECO)*. Pittsburgh, PA: Duquesne University Press.



Interactive Radio for Health

Research Finding

Interactive radio instruction (IRI) may be a cost-effective mechanism for improving the efficiency, accessibility, and quality of health education systems in developing countries.

Comment

Although IRI has been used successfully for almost 20 years to teach mathematics, science, and language to primary-school children, its application in the field of health had not been tested until 1989. Inspired by its success with using IRI to teach primary level mathematics, USAID/Bolivia requested that the Radio Education Project (REP) test the feasibility of using IRI in primary school settings to address the nation's alarming rates of infant mortality, diarrheal disease, dehydration, and malnutrition.

REP was unique in two major aspects. First, unlike more traditional health education programs that target the adult population, the radio health curriculum was designed for fourth and fifth graders who often act as caretakers for younger siblings, engage in household activities, and are more likely to apply learned basic health concepts and practices as parents. Second, REP presented health information through the formal educational system rather than through traditional mediums.

A key to REP curriculum design was a focus on health behaviors that the child could control. These included behaviors related either to the child's own health or to the health of the child's siblings and family. The content of the REP curriculum was based on findings from a variety of sources including an extensive review of health, ethnographic, and anthropological studies; field research into the children's perception of specific health problems and interventions; interviews with local health education experts, community health workers, parents, and children; and visits to participating communities and neighborhood schools. The curriculum was organized in a modular format related to a common theme--in this instance diarrhea prevention and oral rehydration--that could be taught once a week during science, physical education, or home economics classes. Each lesson consisted of a 25-minute recorded program followed by a 20 minute period for teacher-led instruction. Take home exercises were designed to involve family participation with the child.

In a field test with a representative sample of fourth and fifth graders, students showed positive gains in their knowledge of the basic health concepts as indicated by pre- and post-test scores on written assessments. Moreover, teachers felt that the lessons were effective and useful. Parents reported that children were adapting the behaviors at home, becoming more responsible for their own health, implementing learned concepts, and teaching them to their siblings. Parents also requested that the program be broadcast in the evenings so that they could participate in the lessons with other family members.

References

- Fryer, M.L. (1989). *Health Education Through Interactive Radio: A Child-to-Child Project in Bolivia*. Boston, MA: Education Development Center.
- McNulty, J. (1989). *Final Report: Interactive Radio Health Education Pilot Project, Bolivia*. Boston MA: Education Development Center.



Computer-assisted Instruction

Research Finding

Computer-assisted instruction (CAI) can contribute to significant improvement in students' basic skills in reading and mathematics.

Comment

The use of computers in classrooms and other instructional settings in developing countries appears likely to increase during the coming decade. Although current costs for providing computer-related instruction suggest that the introduction of computers is most likely to occur at higher levels in the education cycle, there is evidence that *CAI is also an effective means for improving basic skills in mathematics and reading.*

A study of the use of CAI at a primary school in Grenada showed that students could learn effectively from educational courseware that had been developed for the United States. After 2 1/2 years of daily exposure (about 35 hours per year) to CAI, students using the computer outperformed control students in both reading and mathematics. For mathematics, the mean effect size across three grades was .86 when the CAI classes were compared with control classes. For reading, the effect size was .47.

A study in Jamaica showed *CAI to be an effective way to teach basic skills as part of vocational and technical education programs.* Young men in vocational training centers who received CAI in mathematics dramatically outperformed those who received self-paced, competency-based materials that did not rely on computer delivery. The effect size of the difference in the performance of the students using computers over the control students was 1.05.

In the Philippines, similar positive results were realized from the IBM "Writing to Read" program. In South Africa, the school learning rate of black high school graduates increased from 45 percent to 65 percent with only a few weeks of intensive CAI.

In all of the cases cited above, the results were obtained using software from a comprehensive, well-sequenced curriculum package. The research does not support similar results with the use of an unsystematic collection of software programs.

References

- Anzalone, S. (1990). *Using Computers to Improve Basic Education in Developing Countries: Four Examples.* Arlington, VA: Institute for International Research, A.I.D. Learning Technologies Project.
- Anzalone, S. (1987). *The Effects of PLATO Instruction on Basic Skills in Jamaica.* Arlington, VA: Institute for International Research, A.I.D. Learning Technologies Project.
- Anzalone, S. (1987). *Using Instructional Hardware for Primary Education in Developing Countries: A Review of the Literature.* Cambridge, MA: Harvard University, Project BRIDGES.
- Greene, B.; Royer J.; and Anzalone, S. (1990). *Can U.S. Developed Computer-assisted Instruction Work Effectively in a Developing Country?* (Presentation at the 1990 Annual Meeting of the American Educational Research Association).



A student in Belize builds basic math skills with a low-cost electronic learning aid.

Credit: Stephen Anzalone



Low-cost Electronic Learning Aids

Research Finding

Electronic learning aids offer a potentially affordable way for developing countries to provide effective, interactive instruction in basic skills.

Comment

Electronic learning aids provide a relatively low-cost alternative to more conventional computer-assisted instruction. Electronic learning aids such as the Speak & Spell and Speak & Math manufactured by Texas Instruments are "talking" battery-operated devices that weigh about a pound and provide a variety of drill and practice routines in language and mathematics. These devices differ from computers in that they are easier to use, are less expensive (about \$40), and are not programmable. These learning aids present problems to students in game-like routines and give immediate feedback on the correctness of the response.

Two known studies have documented the effectiveness of electronic learning aids to support primary school instruction in developing countries.

- In Lesotho, it was found that electronic learning aids (the Speak & Read and Speak & Math) can be introduced into primary schools without great cost and difficulty and that the aids stand up well to the physical demands of classroom use. Interviews with teachers and pupils showed a widespread belief that the aids were useful. The results of tests on English word recognition and mathematics showed that students using the aids made greater gains in achievement than those not using them. The differences in achievement were statistically significant. The study showed that the aids had a greater impact on learning among less able students.
- In Belize, a study was conducted on the effects of using the Speak & Math learning aid on achievement of disadvantaged primary school students. On mid-term tests of addition and subtraction, students in the schools using the aids for only two months performed better than the students in the control schools. Although the mean scores of experimental and control classes were nearly identical on a pretest, on the mid-term tests there was a 20 percent difference (effect size of .8) in favor of classes using the electronic aids. Students will be tested again at the end of the 1989-1990 school year.

References

- Anzalone, S., et al. (Forthcoming 1990). *Improving Mathematics Skills with Electronic Learning Aids--Lessons from Belize*. Arlington, VA: Institute for International Research, A.I.D. Learning Technologies Project.
- Anzalone, S. (1988). "High Technology, Literacy, and Lesotho," in *The Future of Literacy in a Changing World*. New York: Pergamon Press.
- Anzalone, S., and McLaughlin, S. (1984). *Electronic Aids in a Developing Country: Improving Basic Skills in Lesotho*. Amherst, MA: Center for International Education.
- Anzalone, S. (1984). "Innovations in Education: Hand-held Electronic Aids in Lesotho." *Development Communication Report*, No. 45.



Audioconferencing and Distance Education

Research Finding

Reliable audioconferencing networks can be created in developing nations using the existing telecommunications infrastructure and then utilized effectively for a variety of distance education and administrative purposes.

Comment

In developed nations, two-way telecommunications facilities have been used for two decades to link multiple, widely-separated locations for the delivery of interactive educational programs. Numerous teleconferencing networks link groups of universities, secondary schools, community centers, hospitals, and company offices for the delivery of formal and non-formal educational programs. Advances in satellite technology have greatly stimulated this trend and have led to the creation of networks linking hundreds of sites together. Although telecommunications facilities in many developing nations are continually being expanded and modernized, little attention has been given to using these communications facilities for educational purposes.

Between 1980 and 1987 A.I.D. worked with developing nations in Asia, Latin America and the Caribbean to create three audioconferencing networks: the University of the West Indies Distance Teaching Experiment (UWIDITE); the Indonesian Distance Education Satellite System (SISDIKSAT); and the Peru Rural Communications Services Project. Each project was a partnership among A.I.D., national telecommunications authorities, and government ministries such as education, agriculture, and health.

A.I.D.'s experiment conclusively demonstrated that two-way telecommunications networks could be created in the developing world, operated with a high degree of technical reliability (90 percent to 98 percent), and used to achieve a wide range of important educational and administrative objectives. These networks made it possible for ministries of education to make improvements in the following illustrative areas:

- the sharing of scarce expertise and teaching resources across great distances, at much lower costs than person-to-person lectures;
- the exchange of ideas by teachers, extension workers, and program administrators with their peers and nationally known experts;
- the management of educational programs; and
- the doubling of inservice teacher certification in the Caribbean within one year.

References

- Asian Development Bank. (1987). *Distance Education in Asia and the Pacific*.
- Block, C.H., et al. (1984) "Satellite Telecommunications for Development: The A.I.D. Rural Satellite Program and Its Pilot Projects in Indonesia, Peru, and the Caribbean," in Wedemeyer, D.J. and Harms, L.S. (Eds). *PTC '84 Proceedings*. Honolulu: Pacific Telecommunications Council.
- Goldschmidt, D.; Tietjen, K.; and Shaw, W. (1987). *A Handbook for Planning Telecommunications Support Projects*. Washington, DC: U.S. Agency for International Development, Bureau for Science and Technology.
- Mayo, J.; et al. (1987). *An Evaluation of the Peru Rural Communications Services Project*. Tallahassee, FL: Learning Systems Institute, Florida State University.
- Tietjen, K. (1987). *An Overview of the A.I.D. Rural Satellite Program*. Washington, DC: U.S. Agency for International Development, Bureau for Science and Technology.



Effectiveness of "Programmed Teaching"

Research Finding

Programmed teaching/learning can provide an effective and affordable means to improve the quality of primary education, especially in settings where teachers are poorly trained or in short supply.

Comment

Programmed teaching/learning systems have been used in several developing countries--including Indonesia, the Philippines, Malaysia, Bangladesh, and Liberia--as a means to improve the effectiveness and efficiency of primary school education. These systems rely on varying combinations of instructional methods and classroom organization to deliver the entire primary school curriculum.

Programmed teaching, which is used more heavily in the early grades, consists of modules that give step-by-step scripts for a teacher's presentation of a lesson, including what to teach (content) and how to teach it (methods and procedures). The programmed teaching module also provides guidance in when and how to ask questions and how to evaluate student performance.

Programmed learning, which is used more at later grades, consists of modules that sequence instruction into small segments. These modules are used in self-instruction, peer learning groups, or cross-age or cross-grade tutoring.

Evaluations of programmed teaching/learning applications in developing countries have been consistently positive with respect to educational effectiveness and efficiency.

- In the Philippines, overall achievement of the first three grades of schools in a region using programmed teaching/learning (IMPACT schools) exceeded the overall regional performance in almost all subjects. This was accomplished at half the cost of conventional schools, with student/teacher ratios averaging 50:1.
- In Indonesia, a study of the PAMONG versions of programmed teaching/learning used with out-of-school youth showed a 100 percent pass rate on the National Standardized Test for primary school graduates.
- In Thailand, students following programmed teaching/learning in RIT (Reduced Instructional Time) schools outperformed students in control schools. This was accomplished in schools where six grades were being taught by four teachers.
- In Liberia, students in the Improved Efficiency of Learning schools that used the programmed teaching/learning scored on average 17 percentile points above control students. This was accomplished with a 71 percent increase in enrollment without increasing the number of teachers.

References

- Cummings, W.K. (1986). *Low-cost Primary Education: Implementing an Innovation in Six Nations*. Ottawa, Canada: International Development Research Center.
- Klees, S.J., and Suparman, M.R. (1984). *An Evaluation of the Costs of PAMONG Schooling Alternatives in Indonesia*. McLean, VA: Institute for International Research.
- Pasigna, A.L. (1985). "Success Story: Liberia's Improved Efficiency of Learning Project." *Performance & Instruction*, 24(9), pp. 7-8
- Project RIT. (1984). *Project RIT: Reduced Instructional Time*. Lopburi, Thailand: Project RIT.
- Spratt, J.E. (1990) *Educational Impacts Model*. Cambridge: Harvard University BRIDGES Project.
- Thingarajan, S., and Pasigna, A.L. (1988). *Literature Review on the Soft Technologies of Learning*. Cambridge, MA: Harvard University, Project BRIDGES.



Textbooks and Academic Achievement

Research Finding

Textbook availability is one of the most consistent predictors of academic achievement among students in developing nations. Levels of available reading materials strongly determine the kind of educational experience a nation is able to provide for its children and youth.

Comment

Although there has been a significant expansion of formal schooling in developing countries over the past few decades, maintaining these new facilities has been very expensive. While primary school teaching staff in most developing countries has quadrupled since 1960, two out of three poor nations have had to reduce educational spending on nonsalary items such as chalk, maps, furniture, equipment, and textbooks. In 1990, half of the world's children typically sit in classrooms sharing only one book among the entire class, learning by rote, or copying probably inaccurately, old, and often inappropriate texts written on a blackboard by an underpaid, undereducated teacher. Many developing countries could improve their educational systems by changing the way their ministries of education procure and produce textbooks.

Providing textbooks to children involves three types of activities: 1) *development activities*, which include specifying learning objectives; establishing curriculum content and organization; preparing, pilot testing, and editing manuscripts; and designing book formats; 2) *production activities*, which include making decisions about paper and binding quality and manufacturing or procuring books; and 3) *distribution activities*, which include distributing books, assuring their proper use in the classroom, and replacing them as necessary.

The following are the most common pitfalls of textbook projects:

- failing to establish a capacity to continuously supply books;
- failing to provide the institutional arrangements needed to coordinate the many parts of the book provision system;
- giving inadequate attention to the quality and appropriateness of the books provided;
- underestimating the difficulties associated with procurement of paper or books, products for which standard (donor) procurement procedures are often inappropriate;
- underestimating the difficulties associated with book distribution; and
- providing support for only a small part of the textbook provision system, usually printing, thereby overloading the capacity of other parts of the system, such as distribution or teacher training.

Experience has shown that these pitfalls can be avoided. A list of possible solutions is included in Figure 4.

References

- Farrell, J.P., and Heyneman, S.P. (1989). *Textbooks in the Developing World*. Washington DC: Economic Development Institute, The World Bank.
- Heyneman, S.P. (1990). "Producing Textbooks in Developing Countries." *Finance and Development*, pp. 28-29.
- Heyneman, S.P.; Farrell, J.P.; and Sepulveda-Stuardo, A. (1978). *Textbooks and Achievement: What We Know*. (Working Paper 298). Washington, DC: The World Bank.

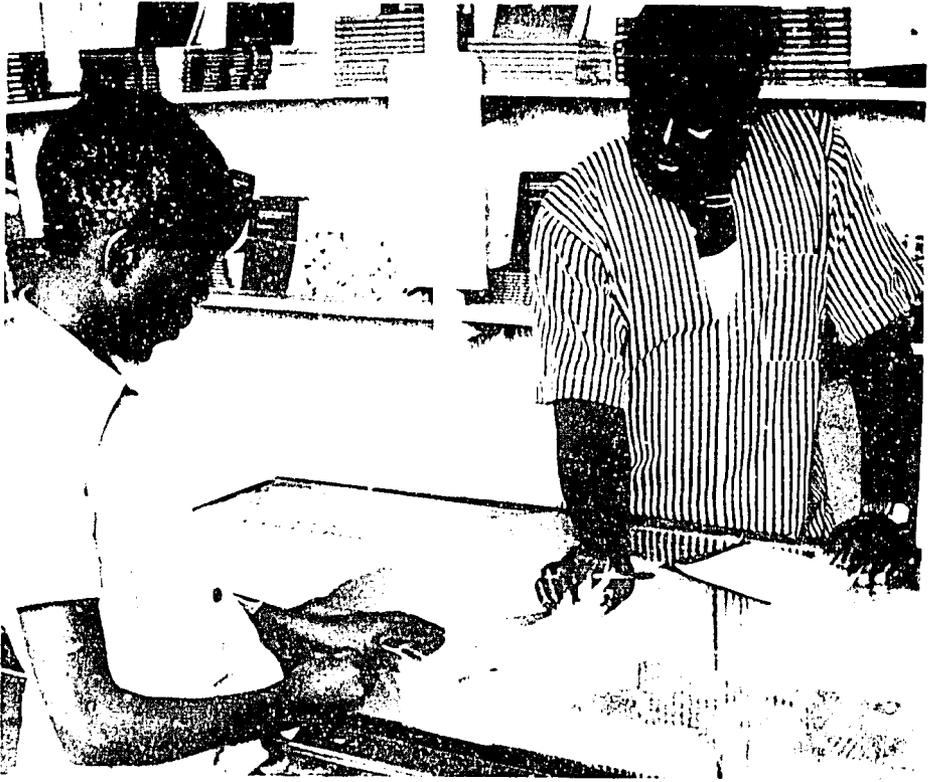
Heyneman, S.P.; Jamison, D.T.; and Montenegro, X. (1984). "Textbooks in the Philosophical Evaluation of the Pedagogical Impact of the Nationwide Investment." *Educational Evaluation & Policy Analysis*, 6(2) pp. 139-150.

Gopinathan, S. (1983). "The Role of Textbook in Asian Education." *Prospects* 13(3).

FIGURE 4
Textbook Development Production and Distribution
Potential Pitfalls and Possible Solutions

Potential Pitfall	Possible Solution
Book provision not sustainable after project	Establish or strengthen appropriate institutions Assure continued financing through government commitment or cost recovery
Constituent activities poorly coordinated	Establish appropriate managerial arrangements Establish appropriate linkages at work level
Slippage in schedules	Adopt realistic schedules Assure adequate management authority to expedite intervening steps
Poor quality books	Have books reviewed by experts, teachers Fieldtest books
Procurement problems	Plan carefully Assure availability of required expertise
Inadequate distribution system	Plan carefully, specifying details of the distribution system Establish monitoring system to detect breakdowns
Inadequate teacher training	Plan appropriate program Assure availability of books during teacher training

Source: Searle, B. (1985). *General Operational Review of Textbooks* (Discussion paper, World Bank Education and Training Series). Washington, DC: The World Bank.



A teacher introduces a new textbook to an eager student.

Credit: The World Bank



Making Textbooks Appropriate

Research Finding

The use of textbooks is most effective when the books are at an appropriate level for the children who will be using them.

Comment

Children learn best from materials that are interesting, appealing, and at the appropriate reading level. Vocabulary should be relevant to the children's daily lives, with understandable examples and illustrations. Frequently textbook projects dramatically fail to meet these criteria.

To help insure the appropriateness of materials, educators should consider the following questions:

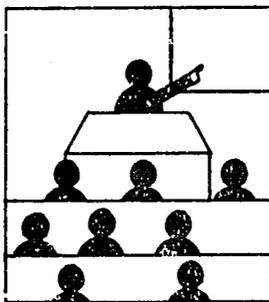
- Are textbooks adapted to the language facility of the children?
- Do language textbooks use effective instructional strategies, particularly second-language learning techniques, where appropriate?
- Are the reading level and vocabulary suitable? Are the examples and illustrations understandable?
- Is the content interesting to the children?
- How are different populations (women vs. men, indigenous vs. European people) treated?
- Does the content match the official curriculum sufficiently well?
- Is there a good match between the pedagogical style of the book and the capability of the teacher?
- Have teachers been trained to use texts during preservice training?
- Has a suitable teacher's guide been provided?
- Is supervisory support available to teachers using new texts?

Whenever possible, these questions should be answered through careful trials with children rather than from personal assumptions.

References

- Elliott, D.C.; Nagel, K.C.; and Woodward, A. (1985). "Do Textbooks Belong in Elementary School Studies?" *Educational Leadership* 42(7), pp. 22-24.
- Fitzgerald, F. (1979). *America Revised*. New York: Atlantic-Little Brown.
- Searle, B. (1985). *General Operational Review of Textbooks*. (World Bank Education and Training Series). Washington, DC: The World Bank.
- UNESCO. (1985). *Textbooks and Related Teaching/Learning Materials for Primary Classes*. Bangkok: UNESCO.

Teacher Training





Instructional media can improve teacher training.

Credit: Teresa Tatto



Effective Teacher Training

Research Finding

Successful teacher training can be accomplished in a workshop setting emphasizing hands-on experiences and transfer of practical skills for classroom use, rather than formal lectures.

Comment

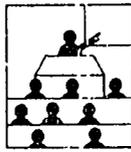
In Haiti, where many private sector primary school teachers lack basic competencies in both academic subject content and pedagogy, lectures delivered by subject specialists at a theoretical level have not proved successful in improving teachers' skills. Training that links concepts with tangible outcomes has been much more effective.

The cornerstone for Haiti's primary school teacher training is hands-on practice. Project training is based on a workshop format that combines basic academic concepts with pedagogy. Teachers are introduced to the academic subject through the construction of teaching materials that can be used in the classroom. Presentation of basic concepts follow, using the fabricated teaching aids. Finally, the group develops appropriate teaching objectives and designs lesson plans based on what they have learned.

This approach is necessarily highly interactive and participatory. Teachers appear more comfortable learning in a group, rather than having individual responsibility for assimilating the material. The resultant teaching materials and lesson plans are immediately put to use in a classroom setting, during practice teaching sessions with school children invited to participate. Teachers are videotaped and their performance is critiqued. (This, in turn, introduces the concept of self-evaluation, which in theoretical presentations to teachers generally meets with resistance.) In essence, the teachers live through the actual subject matter, and academic skills are reinforced by practical ones. The development of teaching materials seems to have a particularly high motivational impact, and teachers express pride in their work.

References

- Pelczar, R., et al. *Improving the Effect of Educational Systems* (report prepared in conjunction with Florida State University). Washington DC: U.S. Agency for International Development.
- Tietjen, K. (1987-1990) *Incentives to Improve Basic Education, Project Reports*. Tallahassee: Florida State University.



Increasing Access to Teacher Training

Research Finding

The multiplier-effect format is an effective approach to train primary school teachers.

Comment

In Swaziland, a formal inservice training program for 240 education personnel resulted in training to over 320 schools and 3,200 teachers. This training, which covered all four areas of the primary school curriculum, was provided in two 2-year phases.

The multiplier-effect format was planned as follows:

- Ten Inspectors and/or Headmasters were selected from each of Swaziland's four regions to serve as District Inservice Education Specialists (DIESs).
- The DIESs, in turn, selected 20 target schools in their region. From each target school one of the best teachers was selected to be a Local Inservice Teacher (LIT). Each DIES had 2 LITs.
- These 40 DIESs and 80 LITs comprised the first cycle of the inservice education cadre.
- The 80 LITs selected a sister school with whom they worked during the two-year program of inservice education. Twenty target schools and 20 sister schools from each of the four regions made up the 160 schools for the first phase of the program.

Each phase was divided into four 6-month training cycles. DIESs and LITs began each cycle by attending a two-week residential workshop on one of the key curriculum areas. Following the workshop, DIESs and LITs returned to their target and sister schools and conducted spin-off workshops. At various intervals after the initial training, DIESs and LITs completed one-day workshops in the same curriculum area and then held follow-up workshops for their target and sister schools.

At the end of Phase I, new DIESs and LITs were selected and the entire process was repeated for a new set of 160 schools.

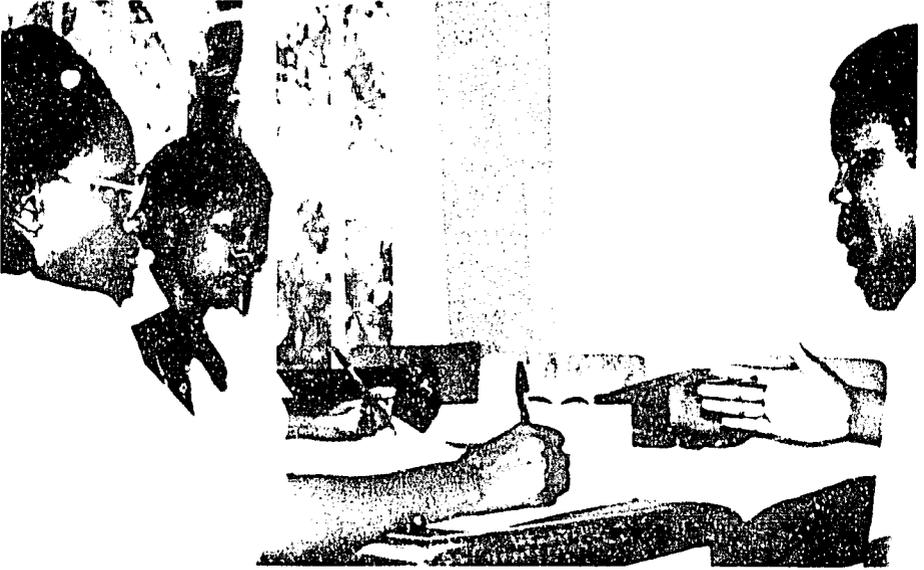
The training was very successful, and the program was enthusiastically received. The training made an immediate impact on the primary education system by bringing teachers up to date on new curriculum and new and better teaching methods. By the end of the first six months of the program, evidence in the form of charts, bulletin boards, teaching aids, etc. could be found in classrooms in well over half of the primary schools in the country. By the end of the fifth year, primary school test scores were improving.

In addition, more training was provided than originally planned. Spin-off trainings were attended by more teachers than intended. Also, in response to participant requests, DIESs and LITs attended monthly and training sessions at regional teacher centers that had been set up under the project to provide upgrading activities.

At the end of the project, the Ministry of Education established a new Department of Inservice Education. The cadre of 240 DIESs and LITs became a resource for curriculum workshops and helped to introduce new teaching methods and curriculum materials.

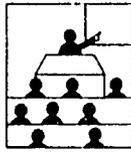
References

- Knox, D.M. (1984-1989). *Ohio University Contract Swaziland Teacher Education Project Reports 1 through 10*. (Unpublished manuscripts.) Athens, OH: Ohio University.
- Leep, A.G., and Knox, D.M. (1990). *Swaziland Teacher Training Project Final Report*. (Unpublished manuscript.) Athens, OH: Ohio University.



Increasing access to teacher training is an important step in improving education.

Credit: Stephen Anzalone



Alternative Teacher Training

Research Finding

Inservice distance education can be more cost effective than preservice or traditional inservice approaches.

Comment

During 1988-89, Project BRIDGES and the National Institute of Education in Sri Lanka undertook a study to determine the effectiveness and costs of three types of training--preservice, institutional inservice, and distance education--in preparing elementary school teachers. The study results were based on a variety of data including teacher candidates' achievement levels, teachers' classroom performance; student achievement; teacher and student responses as indicated on self-administered questionnaires; interviews with program directors and faculty; and training cost figures.

In comparing teacher performance alone, preservice and distance education were more effective. Study results showed the following:

- better overall performance by teacher candidates who participated in preservice training;
- more knowledge of teaching skills and pedagogy by distance education trainees; and
- higher levels of classroom performance by preservice and distance education program graduates.

The distance education program may have worked so well because it was long-term, providing ample opportunity for trainees to integrate what they had learned into their classroom practices.

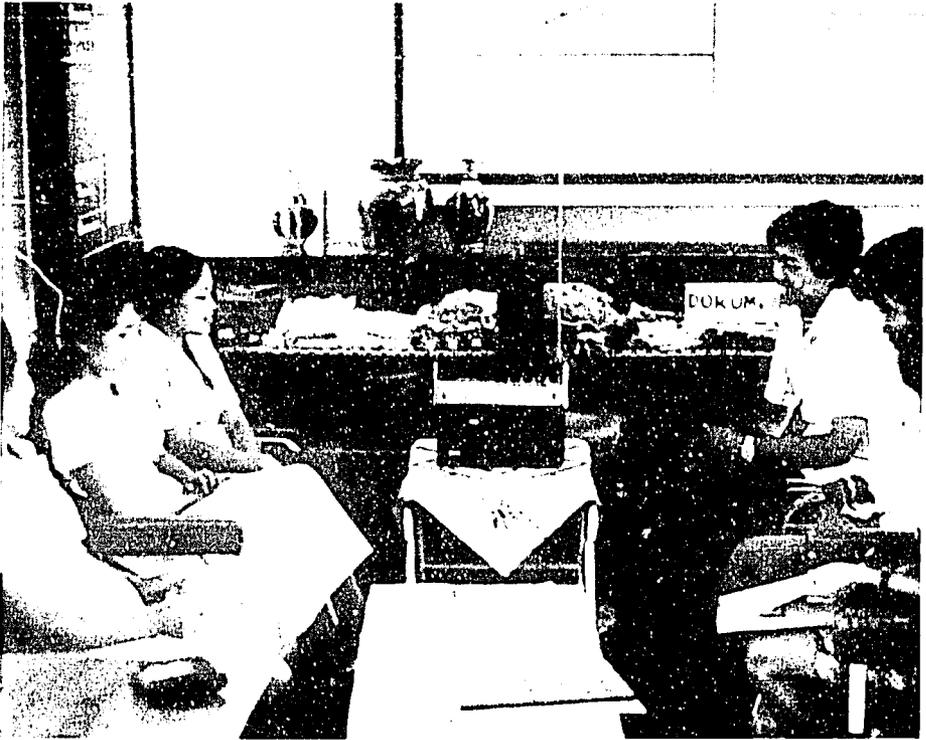
When comparing the costs per cycle (from the point of entrance into the program to the point of exit), however, considering the unit change in outcome per dollar expenditure, the preservice program was 8.69 times more expensive than distance education, and the institutional inservice was 6.15 times more expensive than distance education. In monetary terms, the costs for each type of training program compared as follows:

- preservice program \$2242
- institutional inservice \$1553
- distance education \$ 258

Although the preservice approach seems to be quite effective and fulfills the purposes of the reform in teacher education to educate the whole teacher, this approach is expensive and assumes a high level of qualifications from the teacher candidate. Distance education seems to be the approach to use in training teachers when cost is a primary concern.

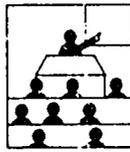
References

Tatto, T.; Cummings, W.; Gunawardena, G.B.; Kularatne, N.G.; Dharmadasa, K.H.; and Nielsen, D. (1990). *Effectiveness and Costs of Three Approaches to Training Elementary School Teachers in Sri Lanka*. (Research report for the BRIDGES project.) Cambridge, MA: Harvard University, BRIDGES Project.



Teachers receive training via radio.

Credit: Anonymous



Radio for Teacher Education

Research Finding

Radio-delivered instruction as inservice teacher training is most effective when used in conjunction with incentive and support systems that stimulate learner motivation and provide periodic face-to-face interaction.

Comment

Over the last decade, the Government of Nepal has experimented with various strategies using radio to provide inservice training to primary school teachers living in villages throughout the country. Initial efforts were intended to help teachers improve their knowledge of the content of the primary school curriculum and of appropriate teaching methodologies.

The efforts to teach content material were generally more successful than attempts to impart new teaching methodologies. Also, programs that linked performance in the radio teacher training program with clear rewards in terms of salary increases and professional promotions were more successful than those that had an indirect or no incentive system. The Ministry made completion of a 150-hour teacher training course a mandatory step for obtaining the status of permanent appointment to a teaching post, which also involves a promotion to a higher paying level.

In addition, the Ministry created a tutoring system to provide monthly face-to-face sessions for clusters of teachers in remote areas. This more rounded program enhanced teacher motivation and performance.

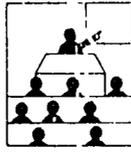
References

- Anzalone, S., and Mathema, S. (1989). *Final External Evaluation: Radio Education Teacher Training II Project (RETT II)*. Nepal: U.S. Agency for International Development.
- Butterworth, B., and Karnacharya, D.M. (1985). *Final External Evaluation: Radio Education Teacher Training I Project (RETT I)*. Nepal: U.S. Agency for International Development.
- Holmes, D. (1989). *Chief Technical Advisor's Final Report: RETT II*. Nepal: U.S. Agency for International Development.
- Karnacharya, D.M., and Khatri, L.P. (1989). *The Radio Education Teacher Training Project: Basic Teacher Training Program*. Nepal: U.S. Agency for International Development.



Inservice training for school principals and administrators is a good investment.

Credit: Stephen Anzalone



Training for School Principals

Research Finding

Because good organization is key to successful teacher performance, complementary inservice training for school principals and directors is a good investment.

Comment

The quality of school directors has been directly linked to teacher performance and school quality in Haiti and elsewhere. It is therefore important to provide training for school directors to prepare them to perform effectively in the school director's role.

School directors in rural and disadvantaged primary schools are often pulled from the teacher ranks and in some countries continue to perform teaching duties. In addition to the teaching responsibilities, school directors are expected to provide professional support to teachers, serve as an extension of the training mechanism, manage school resources, plan quality improvements, and obtain the resources necessary for continued operation and growth.

Many directors are not prepared to provide the sound school management, teacher support, or leadership that they need to provide. Further, when interacting with teachers, school directors sometimes exhibit an authoritarian style that inhibits teacher support.

Haiti has implemented a successful training program for school directors. In addition to teacher training, school directors receive additional training in school administration, record-keeping, budgeting and financial management, and resource needs assessment and planning. Much of this training is tied to the performance contract established between the school and the project, which provides for resource selection from a menu of school inputs predicated on school performance in fulfilling certain quality improvements (attendance records, etc.).

In Thailand, the BRIDGES project found that staff development programs for principals in the areas of school administration, staff supervision, budgeting, planning, and other tasks were significant factors in the improvement of primary school quality during the 1980s. Between 1985 and 1988, all principals were trained. Concurrent with this initiative was a change in the regulations governing the requirements to become a principal. Now principal candidates are required to have minimum qualifications, district and provincial approval, and Ministry of Education-sponsored training in educational administration.

References

- Belan d' Activities (Summary of Activities) 1986-87.* Tallahassee: Florida State University, Incentive to Improve Basic Education Project.
- Belan d' Activities (Summary of Activities) 1987-88.* Tallahassee: Florida State University, Incentive to Improve Basic Education Project.
- Stages d' Eté, 1988: Rapport d' Evaluation.* (1988 Summer Training Course: Evaluation). Tallahassee: Florida State University, Incentive to Improve Basic Education Project.

Summary Statement

It is important to consider the ideas and research findings of what works in relation to the variety of basic education issues facing developing countries. Just as we make comparisons concerning educational progress here at home, we should also seek to find innovations and alternatives that can address the very real needs of basic education in developing countries in spite of different--and often very restrictive--circumstances. We should not be discouraged by any differences in settings.

The conference held February 15-16, 1990 was an important mechanism for strengthening the community and its commitment to basic education understandings. Although there are several large consortia--BRIDGES, IEES, and so forth--who team together to address basic education problems, there has been relatively little transfer of knowledge among agencies, organizations, and institutions about what strategies have been successful and what problems have been experienced within the educational community. This is the first time in nearly a decade that this kind of meeting was convened.

During the two days, there was a demonstrated commonality of goals, methodologies, and to some extent, state-of-the-art language that has begun to cross the agencies of the contractor institutions who are working in the same area. People attended this conference came not only because of its content but also because there is a motivation and an opportunity to begin a new decade by attacking problems cooperatively rather than working in isolation. This monograph, which sets forth the commentary from the meeting, provides a mechanism for further disseminating the information, thereby allowing the conference to have a more significant impact on educational policy related to the four major issues discussed.

In terms of girls' education, the opportunity for seeing the current close integration of gender equity and equal opportunity for girls' education within the mainstream of basic education research was made resoundingly clear. There has been extraordinary movement in this area during the last few years. Girls' education has advanced from a kind of sidebar of interest to a front-and-center position and is being recognized as critical, not just in terms of education demands and needs but also within the context of economic development. Innovations have been made, even where some presumed that tradition would prevent those things from occurring.

In the areas of strategic planning and management improvement, management information systems, statistical information systems, and decision information system designs have clearly matured, not only as tools in and of themselves, but more importantly, as catalysts for clear policy dialogue. This maturation reflects a recognition of the limitations of information and data in terms of actual decisionmaking. Although data collection and organization are important, we must recognize that many other actions are needed as well.

At the same time, the BRIDGES activity has moved solidly to relate the kind of research that ties policy dialogue to the key personnel--the decisionmakers and ministries. Although not always successful, this link with local officials has been proven to be essential for all who are working in the field. Perhaps now the opportunity to interact is greater because there is more confidence in the data. Perhaps also, there is a greater capacity at the top levels of ministries of education to appreciate and utilize this interaction even though there are many other factors that also influence the decisionmaking process.

With respect to the technologies application, we now have more documentation comparing the use of technology to traditional approaches of instruction. Unlike a few years ago, when there were only isolated incidences of the extraordinary differences resulting from technology applications, we are now able to point to data from 12 to 15 countries along a continuum. Results from Nicaragua 15 years ago compare closely with the most recent findings in

Lesotho and Honduras. This extraordinary consistency in the findings is not likely to be found in any other kind of educational innovation during the last 20 years.

With respect to teacher education, there is now an impressive number of references to the very processes that have been used to incorporate distance learning, adult learning, nonformal education, and those practices being applied in highly planned, programmed teacher training and inservice programs. This only reinforces the kinds of methodologies that we have attempted to understand and now have the opportunity to apply toward teacher improvement.

And what are our needs for the future? First, there is a need for more multisectoral program interaction, perhaps even in terms of funding. At a minimum, there is a need to explore more thoughtfully the ways in which the education sector, on a real basis and at a country level, can interact with other sectors in addressing education problems. There is a need to recognize that they now have a common purpose and a common set of goals and objectives with respect to the ultimate outcomes and benefits that can be achieved to improve basic education. This workshop helped to set the tone for cooperative interchange and A.I.D. is to be congratulated for its attempts to integrate various sectors with respect to specific applied education methodologies.

Yet there are bigger benefits to be gained if researchers and practitioners alike look more carefully at some of the social marketing techniques that can be used to disseminate the conference findings with peers and colleagues. Everyone has an opportunity to convey messages to other people of influence. Implementors are not researchers and generally do not write. Rather, they rely on external evaluation and evaluation experts and researchers, who, unfortunately, may not have been close to the implementation. This failure to recognize the need to explicate the lessons learned about the implementation process leads to repeated failings because we do not take advantage of previous experience. We must find new approaches that will help to explicate the implementation and the underlying lessons of practice, and not just the process of learning change. It is important to share the process of implementing a program along with only research findings.

In addition, there is a need to set a new 10-year agenda for research, study, and program implementation. Although the workshop discussions confirmed the maturation of many activities that have been successfully implemented, the world is changing rapidly. We need to think seriously, not only to implement and build upon what has been successful but also to begin to explore new challenges for the coming decade. We need to be extremely proactive in informing the new development agency's leadership about the kinds of things that were discussed. In these times of extreme competitiveness for resources and attention, there is a need to speak out beyond our own community to those who will make the decisions. We should be proactive about a number of issues, including the need to place girls' education highest on the agenda for the 1990s.

Finally, we need new mechanisms for disseminating findings that can cut across contractors, agencies, and sectors, and be presented in a format that highlights not only stimulating discussion but also what works in the field of basic education.

Presenters and Respondents

David Chapman
State University of New York
Albany, NY 12222

Elizabeth King
The World Bank
Washington, DC 20431

Don Knox
Ohio University
Athens, OH 45701

Noel McGinn
Harvard University
Cambridge, MA 02138

Mary Lee McIntyre
FVA/PVC/IPF
Agency for International Development
Washington, DC 20523

Steve Moseley
Academy for Educational Development
Washington, DC 20037

Kurt Moses
Academy for Educational Development
Washington, DC 20037

Aida Passigna
University of Indiana
School of Education
Bloomington, IN 47401

Mary Joy Pigozzi
MUCIA
Washington, DC 20036

Barbara Searle
The World Bank
Washington, DC 20431

Paul Spector
Institute for International Research
Arlington, VA 22209

Maria Teresa Tatto
Michigan State University
BRIDGES Project
East Lansing, MI 48824-1046

Karen Tietjen
Florida State University
Learning Systems Institute
Tallahassee, FL 32306

Thomas Tilson
Educational Development Center
Newton, MA 02160

Workshop Organizers

U.S. Agency for International Development

S&T Office of Education

Clifford Block, Workshop Chair

James Hoxeng

Richard Pelczar

Samuel Rea

PPC/Office of Women in Development

Chloe O'Gara

Agency Director for Human Resources

Antonio Gayoso

Creative Associates International, Inc.

Murray Simon

Technical Consultant

May Rihani

Associate Director, Advancing Basic Education and Literacy Project

Derry Velardi

Conference Coordinator

Workshop Program, Logistics, and Monograph

Organized by

The Advancing Basic Education and Literacy Project (ABEL)

ABEL Consortium:

Academy for Educational Development

Creative Associates International, Inc.

Harvard Institute for International Development

Research Triangle Institute

Workshop Participants

Charles Aanenson
ANE/TR/HR
Agency for International Development
Washington, DC 20523-0053

Steve Anzalone
Institute for International Research
1815 N. Fort Myer Drive, Suite 600
Arlington, VA 22209

Victor Barnes
PPC/PDPR/SP
Agency for International Development
Washington, DC 20523-0001

Jean Bergaust
S&T/PO
Agency for International Development
Washington, DC 20523-1804

Clifford Block
S&T/ED
Agency for International Development
Washington, DC 20523-1815

Jack Bock
Florida State University
Learning Systems Institute
204 Dodd Hall
Tallahassee, FL 32312

David Chapman
State University of New York at Albany
School of Education
1400 Washington Avenue
Albany, NY 12222

Ray Chesterfield
Academy for Educational Development
1255 23rd Street, NW
Washington, DC 20037

Philip Coombs
Box 217
Essex, CT

Amalia Cuervo
S&T/ED
Agency for International Development
Washington, DC 20523-1815

Desiree deGraeve
Creative Associates International, Inc.
5301 Wisconsin Avenue, NW
Suite 700
Washington, DC 20015

Donald Foster-Gross
PFM/PM/PD/PCT
Agency for International Development
Washington, DC 20523

Hal Freeman
Education Development Center
1250 24th Street, NW
Suite 875
Washington, DC 20037

Stephanie Funk
PPC/WID
Agency for International Development
Washington, DC 20523-0041

Antonio Gayoso
S&T/HR
Agency for International Development
Washington, DC 20523-1816

Daniel Gerber
School of Education
UMASS/Amherst
Amherst, MA 01003

Marilyn Gillespie
School of Education
UMASS/Amherst
Amherst, MA 01003

Suzanne Grant-Lewis
AFR/TR/EHR
Agency for International Development
1255 23rd Street, NW
Washington, DC 20523-1515

Sue Hubbard
S&T/ED
Agency for International Development
Washington, DC 20523-1815

James Hoxeng
S&T/ED
Agency for International Development
Washington, DC 20523-1815

Beverly Jones
Academy for Educational Development
1255 23rd Street, NW
Washington, DC 20037

Elizabeth King
The World Bank
1818 H Street, NW
Washington, DC 20431

Don Knox
Ohio University
College of Education
Athens, OH 45701

Charito Krivant
Creative Associates International, Inc.
5301 Wisconsin Avenue, NW
Suite 700
Washington, DC 20015

Mary Lee McIntyre
FVA/PVC/IPF
Agency for International Development
Washington, DC 20523

Frank Method
PPC/PDPR/SP
Agency for International Development
Washington, DC 20523-0001

Anthony Meyer
S&T/ED
Agency for International Development
Washington, DC 20523-1815

William Miner
BIFAD/S/CP
Agency for International Development
Washington, DC 20523

Stephen Moseley
Academy for Educational Development
1255 23rd Street, NW
Washington, DC 20037

Kurt Moses
Academy for Educational Development
1255 23rd St. et, NW
Washington, DC 20037

Chloe O'Gara
PPC/WID
Agency for International Development
Washington, DC 20523-0041

Aida Passigna
University of Indiana
School of Education
Bloomington, IN 47401

Richard Pelczar
S&T/ED
Agency for International Development
Washington, DC 20523-1815

Mary Joy Pigozzi
MUCIA
1215 17th Street, NW
Washington, DC 20036

Julie Rea
AFR/TR/EHR
Agency for International Development
Washington, DC 20523-1515

Samuel Rea
S&T/ED
Agency for International Development
Washington, DC 20523-1815

May Rihani
Creative Associates International, Inc.
5301 Wisconsin Avenue, NW
Suite 700
Washington, DC 20015

Donovan Russell
Academy for Educational Development
1255 23rd Street, NW
Washington, DC 20037

Jorge Sanguinety
Development Technologies, Inc.
818 18th Street, NW
Suite 940
Washington, DC 20006

Barbara Searle
The World Bank
1818 H Street, NW
Washington, DC 20431

Kathleen Selvaggio
Clearinghouse on Development
Communication
1815 N. Fort Meyer Drive
Suite 600
Arlington, VA 22209

Paul Spector
Institute for International Research
1815 N. Fort Myer Drive
Suite 600
Arlington, VA 22209

Jennifer Spratt
Research Triangle Institute
P.O. Box 12194
Research Triangle Park, NC 27709-2194

John Swallow
ANE/TR/ARD
Agency for International Development
Washington, DC 20523-0053

Maria Teresa Tatto
Michigan State University
BRIDGES Project
210 Erickson Hall
East Lansing, MI 48824-1046

Karen Tietjen
Florida State University
Learning Systems Institute
204 Dodd Hall
Tallahassee, FL 32306

James Terry
P.O. Box 18153
Washington, DC 20036

Tom Tilson
Educational Development Center
55 Chapel Street
Newton, MA 02160

Leonel Valdivia
Development Associates
2024 Columbia Pike
Arlington, VA 22204-4399

Janet Whitla
Educational Development Center
55 Chapel Street
Newton, MA 02160

Charles Williams
Florida State University
IEES Project
204 Dodd Hall
Tallahassee, FL 32306

Earl Yates
Academy for Educational Development
1255 23rd Street, NW
Washington, DC 20037

For Additional Information

Advancing Basic Education and Literacy (ABEL)

Donovan Russell
Academy for Educational Development
1255 23rd Street, NW
Washington, DC 20037

Audioconferencing and Distance Education

Clifford Block
Office of Education
Bureau for Science and Technology
U.S. Agency for International Development
Washington, DC 20523

Basic Research and Implementation in Developing Education Systems (BRIDGES)

Noel McGinn
Gutman Library, Room 452
Harvard University
Cambridge, MA 02138

Clearinghouse on Development Communication II

Michael Laflin
Institute for International Research
1815 North Fort Myer Drive
Arlington, VA 22209

Education of Girls and Women

Elizabeth King
The World Bank
1818 H Street, NW
Washington DC 20006

Chloe O'Gara
Women in Development Office
U.S. Agency for International Development
Washington, DC 20523

May Rihani
Creative Associates International, Inc.
5301 Wisconsin Avenue, NW
Suite 700
Washington, DC 20015

Educational Technology Studies and Applications

Stephen Anzalone
Learning Technologies Project
Institute for International Research
1815 North Fort Myer Drive
Arlington, VA 22209

Improving Efficiency of Educational Systems (IEES)

Robert Morgan
Florida State University
206 Dodd Hall
Tallahassee, FL 32306

Radio Science/Radio Learning

Thomas Tilson
Education Development Center
55 Chapel Street
Newton, MA 02160

Swaziland Teacher Training Project

Donald Knox
366 McCracken Hall
Ohio University
Athens, OH 45701

World Bank Textbook Analysis

Stephen Heyneman
Barbara Searle
The World Bank
1818 H Street, NW
Washington, DC 20006