

11102  
August 1992

# Distance Education in Anglophone Africa

*Experience with Secondary Education  
and Teacher Training*

Editors

Paud Murphy

Abdelwahed Zhiri

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EDI DEVELOPMENT POLICY CASE SERIES  
ANALYTICAL CASE STUDIES • No. 9

# Distance Education in Anglophone Africa

*Experience  
with Secondary Education  
and Teacher Training*

Edited by  
**Paud Murphy**  
**Abdelwahed Zhiri**

The World Bank  
Washington, D.C.

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and Development / THE WORLD BANK  
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Manufactured in the United States of America

First printing August 1992

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The backlist of publications by the World Bank is shown in the annual *Index of Publications*, which is available from Distribution Unit, Office of the Publisher, The World Bank, 1818 H Street, N.W., Washington, D.C. 20433, U.S.A., or from Publications, Banque mondiale, 66, avenue d'Iéna, 75116 Paris, France.

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#### Library of Congress Cataloging-in-Publication Data

Distance education in anglophone Africa : experience with secondary  
education and teacher training / edited by Abdelwahed Zhiri, Paud  
Murphy.

p. cm.—(EDI development policy case series. Analytical  
case studies ; no. 9)

Papers presented at a seminar for senior policymakers held in  
Zimbabwe May 7–11, 1990 sponsored by the Economic Development  
Institute of the World Bank and Higher Education for Development  
Cooperation.

Includes bibliographical references.

ISBN 0-8213-1908-6

1. Distance education—Africa, Sub-Saharan—Congresses.  
2. Education, Secondary—Africa, Sub-Saharan—Congresses.  
3. Teachers—Training of—Africa, Sub-Saharan—Congresses.  
I. Zhiri, Abdelwahed, 1934– . II. Murphy, Paud. III. Economic  
Development Institute (Washington, D.C.) IV. Higher Education for  
Development Cooperation (Organization: Ireland) V. Series.  
LC5808.A357D57 1991  
373.13—dc20

91-28366  
CIP

EDI Catalog No. 150/004



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## FOREWORD

This book consists of a collection of papers presented at a seminar for policymakers held in Zimbabwe from May 7 to 11, 1990, and organized jointly by the Economic Development Institute of the World Bank and Higher Education for Development Cooperation (HEDCO) of Ireland. The seminar provided a forum for African officials to discuss the potential of distance education to provide increased access to second-level education as well as cost-effective teacher training. The book, which is intended to be of use to policymakers and practitioners, discusses the relative effectiveness, cost and status of distance education as well as its organization and management and contains a number of important studies of distance education systems functioning in Africa.

Amnon Golan

Director

Economic Development Institute



## ABBREVIATIONS

DNFE	Department of Non-Formal Education (Zimbabwe)
EDI	Economic Development Institute (of the World Bank)
GNP	gross national product
IAE/NCI	Institute of Adult Education/National Correspondence Institute (Tanzania)
HEDCO	Higher Education for Development Cooperation
JC	junior certificate (Malawi)
KSDS	Kenya School of Distance Studies
LDTC	Lesotho Distance Teaching Center
MCDE	Malawi College of Distance Education
MCE	Malawi Certificate of Education
MNE/DTE	Ministry of National Education/Department of Teacher Education (Tanzania)
NCC	National Correspondence College (Zambia)
O-level	ordinary level
PSLE	primary school leaving examination
SADCC	Southern Africa Development Coordination Conference
TTC	teachers training college (Tanzania)
TTD	teachers training through distance education (Tanzania)
UNESCO	United Nations Educational, Scientific, and Cultural Organization
UNICEF	United Nations Children's Fund
UPE	universal primary education
USAID	U.S. Agency for International Development
ZINTEC	Zimbabwe Integrated National Teachers Education Course



## PREFACE

*Paud Murphy and Abdelwahed Zhiri*

In the early 1980s, the world economic depression and very high population growth rates in Sub-Saharan Africa combined to cause serious reductions in per capita GNP (World Bank 1986, p. 154). As a result, education has suffered. Absolute levels of expenditure on education in Sub-Saharan Africa have fallen almost 3 percent annually in real terms during the 1980s (World Bank 1988, pp. 1-3).

The region's governments are committed to universal primary education and gross enrollment ratios at this level are generally higher than at the other levels of education, averaging 70 percent for Sub-Saharan Africa in 1986. The provision of sufficient numbers of well trained and motivated teachers is one of the most important tasks that the region's governments face in maintaining enrollment ratios and teaching quality. Enrollment ratios at the second level are much lower than at the first level, averaging only 23 percent in 1986 (World Bank 1990). With growing numbers of children completing primary school, governments are faced with increasing demand for access to second-level education. Satisfying that demand with limited resources is a major challenge. As the minister of education from Zimbabwe points out in chapter 1:

The greatest educational challenge facing African countries today is how to design a system or a learning package that both meets individual country's priorities and also maximizes learning in a cost-effective way using the resources available.

One such system, distance education, is the focus of this book. As Perraton defines it in chapter 2, distance education is an educational process in which someone removed in space and/or in time from the learner conducts a significant proportion of the teaching. This definition includes some face-to-face teaching and also embraces a variety of different media, including print and broadcasting.

### The Seminar

This book consists of papers presented at a seminar for senior policymakers held in Zimbabwe from May 7-11, 1990, and subsequently edited. The Economic Development Institute (EDI) of the World Bank and Higher Education for Development Cooperation (HEDCO), the Irish government-sponsored educational aid agency, organized the seminar. The Irish government, the World Bank, and the Canadian International Development Agency provided financial support, while the Commonwealth Secretariat and the Commonwealth of Learning provided consultants.

In the context outlined already, the seminar focused on the use of distance education to increase access to second-level education and to provide cost-effective teacher

education. Representatives from Botswana, Ethiopia, Ghana, Kenya, Lesotho, Malawi, Mauritius, Nigeria, Sudan, Swaziland, Tanzania, Zambia, and Zimbabwe attended. Observers attended from the International Council of Distance Education and the United Nations Educational, Scientific, and Cultural Organization.

## The Book

Following an introduction by the Honorable Fay Chung, Minister of General Education in Zimbabwe, that identifies the problems of education in Africa and the role that distance education can play in helping to resolve them, the remaining chapters are divided into three parts. Chapters 2 to 4 are concerned with the potential and use of distance education for formal education, chapters 5 to 7 discuss the use of distance education to provide second-level education, while chapters 8 to 10 concentrate on the uses of distance education to qualify teachers. The final chapter discusses some of the findings of the earlier chapters and presents the recommendations made by the seminar participants.

## Themes Addressed

Two of the more important questions to answer about distance education are how effective is it and how much does it cost? For policymakers the two questions are most usefully answered in relation to other modes of provision. Thus, the answers to how effective is a distance education mode of educating teachers compared to the conventional residential course alternative, and how much more or less does it cost to produce a secondary school examination pass using distance education than it costs through a regular school provide policymakers with information on which they can act. The two themes of relative effectiveness and costs recur throughout the book. So does the theme of relative status. Why, despite many reported successes, do the general public and many educators view distance education as inferior to conventional schools and colleges? A fourth theme is the organization and management of distance education. Many specialized institutions now exist in Africa. Are they well managed? Do they use the best technical practices? What special problems do they encounter?

We hope that this book will provide some answers to the questions about relative effectiveness, cost, and status and suggest some guide lines on organization and management that will be of value to policymakers and practitioners in Africa and to those interested in distance education everywhere.

Paud Murphy  
Abdelwahed Zhiri

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# 1

## INTRODUCTION

*Fay Chung*

This seminar comes at a most opportune time in view of the recent World Bank report on education in Sub-Saharan Africa (World Bank 1988), and also in view of the critical nature of the policy issues that face many African developing countries today.

The seminar is concerned mainly with distance education as an alternative to secondary education and to current practices in teacher training in Africa. It covers world trends in distance education at the secondary level, current use and effectiveness of distance education systems in Africa, and alternative options for improving distance education systems.

Zimbabwe, unlike many other African countries, has achieved universal primary education and phenomenal expansion has taken place at the secondary school level. Despite this massive expansion, the demand for secondary education continues to outstrip the supply of physical facilities and teachers. At the same time, financial constraints and other more pressing priorities make it impossible for the government to make more resources available to the Ministry of Education to provide conventional secondary and teacher training education to all those who need it. Other nations are facing similar problems.

It is common knowledge that the quantitative expansion of education has not been met with quality education, and that this expansion has put pressure on various sectors of each nation's economy, including the need to train more teachers and to provide physical facilities and suitable teaching materials. While conventional education in many African countries is beset by declining financial resources, the demand for education in formal institutions has far outstripped the capacities of our economies. Both young people and adults need more than just a rudimentary education to control and make sense of their environment. This is because of the continuing explosion of knowledge that, in turn, is giving rise to the explosion of education.

The greatest educational challenge facing African countries today is how to design a system or a learning package that both meets individual country's priorities and also maximizes learning in a cost-effective way using the resources available. A distance education system that combines radio and correspondence techniques could be Africa's salvation. The stark and unfortunate situation in many of our countries is that people across the board regard nonformal avenues of secondary schooling, such as distance education, which provides a second chance to all those who dropped out or were pushed

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*This chapter has been taken from the opening remarks addressed to the seminar by the Honorable Fay Chung, M.P., Minister of General Education, Zimbabwe.*

out of school, as a second-rate education. The reality is that distance education can and should be a more efficient and cost-effective method of education.

A further economic advantage of distance education is that unlike formal schooling, it lends itself to economies of scale, for once the initial capital outlay is made and materials produced, unit costs decrease with expansion. Another argument for distance education is that its flexibility permits young people and adults to continue learning after they have left the formal system. People learn what they want, when and where they want.

The benefits are substantial. First, educated people can get more out of life in the cultural sense. Second, educated people are better consumers, and are therefore more likely to manage their household budgets more efficiently. Third, the educated will be able to absorb and process information more effectively. Note, however, that education planners underplay the importance of these benefits when they discuss the cost-benefits of investing in education. To developing countries, which have to rely to a very large extent on their own human resources to develop socially, politically, and economically, these benefits are substantial indeed.

Distance education must also be seen as an attempt to keep the adult population abreast of technological changes in science, agriculture, engineering, and other fields, as specialized knowledge becomes obsolete every four years or so.

Therefore, African countries should invest more money in distance education. This will go a long way toward alleviating the problems of inadequate access to formal education, rising costs, and poor quality education that bedevil Africa today.

Distance education programs have been and are currently being used in many developing countries. India, for example, relies on distance teaching to ensure that a significant proportion of its population has a secondary education. Countries like Kenya, Malawi, Tanzania, Zambia, and Zimbabwe have vibrant distance teaching programs. Yet many other developing countries have still to realize their potential.

In Zimbabwe, private, commercial correspondence colleges have offered both academic and nonacademic courses for some time. To reduce students' tuition costs, the Ministry of Education pays a portion of the fees directly to the college for members of established study groups. Each group has a mentor or mentors who supervise students during study sessions and are paid by the ministry. Currently some 30,000 students are enrolled in nearly 700 study groups throughout Zimbabwe.

In recognition of the role that distance education can play in reducing the cost of education and increasing access to secondary school education, Zimbabwe's Ministry of Education is establishing a government distance teaching institution, to be called the Zimbabwe Institute for Distance Education. This institute will initially focus on developing and producing self-instructional learning materials for people who want to obtain secondary school academic qualifications. In due course, the institute will also produce noncertificate courses of a practical nature for school leavers and rural people, particularly women. This institution will complement the efforts of private, commercial correspondence colleges.

Distance education in Africa must be closely aligned to governments' overall educational policies, and whenever possible be integrated with the national system of education. For this reason, governments should take an active role in distance education and not leave it entirely in the hands of private, commercial correspondence colleges.

Furthermore, active government participation will help ensure that the public does not view distance education as second rate.

All those interested in using distance education face two important challenges. The first challenge is how to obtain parity of esteem between distance education and the formal system of education in the eyes of the technocrats and the general public. The second is to develop effective and implementable strategies that will improve the overall quality of distance teaching in all its various facets. I am confident that this book will go some way to meeting these two challenges.

## Reference

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# Part I

## DISTANCE EDUCATION: POTENTIAL AND USES FOR FORMAL COURSES

The next three chapters review some of the uses of distance education and its potential to provide formal courses.

The advantages of distance education include its cost-saving potential and flexibility. Cost savings generally result from replacing the teacher with self-instructional materials. As Fay Chung, Zimbabwe's minister of education, put it in chapter 1: "Once the initial capital outlay is made and materials produced, unit costs decrease with expansion." While good self-instructional materials are expensive to develop, once they have been prepared the cost of reproducing them is relatively low. This is in contrast to traditional systems of classroom education, where costs are mainly determined by teachers' salaries and rise directly with student numbers. Thus, distance education has the potential to achieve significant economies of scale.

The flexibility of many distance education systems permits students to study what they want, when and where they want. Countries have used distance education systems to solve a wide range of educational problems at a number of educational levels. Examples range from radio campaigns to help rural people in Tanzania improve their health to providing university-level education for British adults.

The key word with most distance education systems is, however, potential. As Perraton points out (chapter 2), although distance education systems have been used to provide a wide range of information and education using a variety of organizational structures, many issues still need to be resolved. Perraton concentrates on the use of distance education for conventional education purposes, and addresses internal efficiency, cost per student, and the intrinsic quality of studying at a distance. Questions also remain about whether distance systems can replace traditional ones and save costs while retaining quality. One of the most serious obstacles to distance education is the perception on the part of educators and the general public that distance education is second rate.

Curran and Murphy (chapter 3) move from the potential to the actual in their review of distance education at the second level and for teacher education in Ethiopia, Kenya, Lesotho, Malawi, Zambia, and Zimbabwe. They were particularly interested in the actual use of distance education to solve educational problems in these six countries. They found that the governments of the six countries use distance education to address three educational problems: access to second-level education for recent primary school leavers, second-chance education for working adults, and teacher training.

Curran and Murphy also examined institutional structures for distance education, the management and administration of programs, media and teaching methods, and cost

efficiency. For each of these they provide recommendations on how institutions can improve their performance.

The central theme of Teas' chapter (chapter 4) is the potential of distance education to improve girls' access to education. Girls' school attendance is affected by lack of access, poverty, inflexible school schedules, irrelevant curricula, and lack of female teachers as well as social attitudes toward women and job availability. Teas demonstrates the potential for distance education to overcome these problems.

## 2

# A REVIEW OF DISTANCE EDUCATION

*Hilary Perraton*

Distance education in Africa is not new. Stretching a point, Martin Kaunda, the doyen of adult education in Zambia, saw the talking drum as its ancestor (Kabwasa and Kaunda 1973, p. 3). As early as the 1960s, Botswana, Kenya, Malawi, and Zambia were among the countries whose governments decided to use distance education for teacher training and secondary education. By the mid-1980s, Commonwealth Africa alone had twenty-five to thirty publicly-funded distance teaching institutions. After twenty-five years' experience, the data to show whether distance education is a short-term expedient or whether it has a permanent place in the armory of ministries of education should now be available.

For convenience, I will define distance education as an educational process in which someone removed in space and/or time from the learner conducts a significant proportion of the teaching. The definition thus embraces programs in which some face-to-face education is linked with work at a distance. It also embraces work that uses a variety of different educational media, including both print and broadcasting.

To appraise the significance of distance education for Africa, we can start by examining the purposes for which it has been used and the institutional forms it has taken. In the light of that discussion we can examine its educational effectiveness and the policy questions that arise as a result of the findings.

### Why Use Distance Education?

According to the the Lockwood Committee, which drew up plans for the University of Zambia:

If the aim of providing wide opportunities for higher studies is to be fully realized, it would be wrong to limit the activities of the University and its contribution to the advancement of the people by restricting formal association with the University to those who could spend several years of full-time or part-time study on the campus... It is, therefore, of the greatest importance that the regulations of the University should allow its examinations for degrees and other qualifications to be open to candidates who have pursued their study externally (Kabwasa and Kaunda 1973, pp. 80-81).

That recommendation led to the establishment of a correspondence department at the university from its foundation.

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*The views expressed here are Dr. Perraton's and do not necessarily represent those of the Commonwealth Secretariat or the World Bank.*

In Swaziland, the William Pitcher Teacher Training College, which used distance education, had the following objectives (Young and others 1980, p. 31):

- To improve the country's teaching strength by training some 600 primary school teachers;
- To inculcate modern methods, not only for use by the trainees, but also as a way to change others;
- To organize the training in such a way that it caused the minimum of disruption to the staffing of schools.

In Zambia, the objectives of the National Correspondence College (Siaciwena 1981, p. 17) were to offer secondary education to:

- Teachers with professional training that lacked the required academic qualifications;
- Other adults wanting to pursue further academic education leading to certification (directed mainly at persons currently employed to help them pursue career advancement);
- Primary school leavers who failed to enter the formal secondary school system.

These examples illustrate a common trend: distance education has been used to pursue entirely conventional educational ends of the kind that shape the agenda of every ministry of education in Africa. It has been used to widen access to education; to raise the quality of education, both through teacher training and by bringing resources into the classroom; and to bring new methods and approaches into the schools. In doing so, distance education has attempted to address the geographical problems that confront most educational systems on the continent, and it has been valued because it seemed to offer economic advantages that were significant to any hard-pressed ministry of education or finance.

Its main advantages relate directly to the source of the problems. First is its economy: school buildings are not required and teachers and administrators can be responsible for many times more students than they can accommodate in a school. Its second main advantage is its flexibility: people who have got jobs can study in their own time, in their own homes without being removed from their work for long periods. Its third advantage is its seven-league boots: it can operate over long distances and cater for widely scattered student bodies (Dodds, Perraton, and Young 1972, p. 10).

Thus, while the methods of distance education may be unconventional, the purposes for which it has been used are entirely conventional. In assessing its significance, therefore, we should ask much the same questions about distance education that we ask about other forms of education. To put those questions in context, we need first to look at the forms that distance education has taken in Africa and elsewhere.

### **How Is Distance Education Organized?**

We have defined distance education so that it includes print, broadcasting, and limited face-to-face education. The elements reinforce each other, but have different economic structures and different organizational consequences. The economic differences are that print and broadcasting allow for economies of scale, from which may come savings that make distance education attractive on economic grounds, while the costs of face-to-face education necessarily rise more or less in line with the number of students.



Distance education is simply a way to develop and distribute teaching materials, to link different media, and to plan occasional face-to-face sessions for external students. In consequence, it demands staff who combine educational and administrative skills in a different way from the ordinary teacher. Similarly, it demands new alliances, between educators and broadcasters, for example, and between those concerned with education in school and outside.

The methods it uses are quite varied. In-school programs to raise the quality of education, have, for example, concentrated heavily on radio. Some out-of-school programs aimed at external students have relied almost entirely on print. In the industrialized world, distance education programs are beginning to use computer and satellite links for both communication and teaching. A sound choice between media will depend on the availability of each medium to the student and on the cost. However, distance education is not necessarily dependent on any single medium, be it print, television, or radio, and the evidence suggests that students benefit if more than one medium can be used for teaching.

Using some or all of these methods, distance education has been used both in school and out of school for both formal and nonformal education, and at all levels from primary school to postgraduate degrees. Table 2.1 sets out various models of distance education.

**Table 2.1 Models of Distance Education**

<i>Level</i>	<i>In school</i>	<i>Out of school</i>
Primary	Environment broadcasts (e.g., many school radio services) Large TV projects (e.g., Côte d'Ivoire) Interactive radio (e.g., Kenya for English teaching)	Little African experience; some radio-based community projects in Latin America
Secondary	Correspondence courses for learning centers (e.g., Malawi) Enrichment broadcasts Large TV projects; no African experience, but used in El Salvador and Samoa To widen curriculum (e.g., Mauritius) For small groups in remote schools	Correspondence courses (e.g., Ghana, Botswana)
Teacher training	Not used	Pre- and in-service training with correspondence backed by radio and vacation study (e.g., Swaziland, Tanzania)
Tertiary	Intercampus links (no African experience, but used by University of the West Indies, Zambia) Open universities (i.e., separate autonomous institutions) no African experience	Degree courses predominantly by correspondence run by conventional universities (e.g., Lagos,

The table omits one block of experience with distance education that is important, but of limited relevance to this book. In Africa, as elsewhere, countries have used distance education for nonformal education in areas like health, agriculture, family planning, rural development, and political education. Botswana, Tanzania, and Zambia have all used radio campaigns for public education on a large scale. Beyond Africa, the radio schools of Latin America have worked outside the state education system to offer basic education to adults and children outside school. Within Africa, the Institut Africain pour le Développement Economique et Social (INADES-formation), with its headquarters in Côte d'Ivoire and units in both francophone and anglophone Africa, has used distance teaching methods to teach rural farmers better agricultural practices.<sup>1</sup> Ministries of agriculture and health have used distance teaching methods, sometimes referring to them as development support communication. Investigators have documented both the successes and failures (see Homik 1988; Perraton and other 1983; Young and others 1980). The potential for expanding the use of distance education for these nonformal purposes remains important, but is not considered further here.

For our purposes, a useful distinction is between the use of distance education within school and out of school. There is, of course, long experience of using school broadcasts for enrichment at both the primary and secondary levels. More recently, some countries have used direct teaching, with large, television-based schemes in Niger and Côte d'Ivoire, and more modest schemes using radio for one part of the curriculum in Kenya and Lesotho, following models developed in central America. Zimbabwe has experimented with the use of distance teaching methods to bring resources into its secondary schools, while Malawi and Zambia have developed study centers supported by correspondence teaching as a kind of second-tier system of secondary education. Other chapters examine these schemes in more detail.

Out-of-school education has used distance teaching methods to provide an alternative route to secondary and tertiary education and to train teachers. At the secondary level, African distance teaching institutions have long experience of using correspondence courses, with some radio support and face-to-face guidance, for students outside school. They have used teacher training programs to teach both pedagogy and subject material to experienced teachers and newly recruited trainees, and integrated the programs with regular programs of support for teachers in different ways.

Tertiary education is not discussed in this book, and therefore demands some attention at this point. If distance education has become accepted and legitimate in the last quarter century, this is largely due to the open universities. The British Open University, established in 1969, is now the second largest university in the country (after the University of London), not just in student numbers, but in number of annual graduations. In crude terms, it is producing one-fifth of the country's graduates for one-ninth of the cost. However, it has had another effect that may in the long run be as significant: bringing distance education out of the dark, away from the image of unsuccessful studying from yellowed sheets of duplicated notes, and into a position where people are proud to be students of the university and the university is justifiably proud of the quality of its educational materials. Where that university led the way,

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1. INADES-formation was founded in 1962 as a result of resolutions at a conference of Catholic bishops from francophone Africa. It now operates in a number of countries in anglophone and francophone Africa.

some twenty others have followed, in India and Pakistan, Thailand and Indonesia, Spain and Venezuela among others, but not in Africa.

Distance education at the tertiary level does not demand an open university. There is an alternative tradition that goes back to the University of Queensland in 1911 of establishing a bimodal university that teaches both face-to-face and at a distance. This has become the dominant pattern in the two rich Commonwealth countries with federal constitutions, Australia and Canada, and this model has influenced the thinking of the universities of Lagos and Zambia, which already have departments of distance education, and of the University of Zimbabwe, which is considering establishing one.

However, there may be a case for an African national or regional open university. The quality of the teaching material produced by open universities is possible because significant resources are committed to course development. In turn, the scale of these resources is justified by the relatively large number of students who are likely to enroll in the courses. In anglophone Africa, however, with the single exception of Nigeria, national populations are smaller than those of most countries that have successfully established open universities. Thus, for any one country to justify investment in course development at the tertiary level on the scale that has led to the success of the existing open universities is difficult. Similarly, even where universities decide to establish a distance education department, they are likely to have serious difficulties in releasing adequate funds for course development. These and other considerations have led the Southern Africa Development Coordination Conference (SADCC) to consider the possibility of establishing some kind of cooperative structure for distance education within the region (see Jevons, Northcott, and Polhemus 1987; Leibbrandt 1989), a proposal that is in accord with the World Bank's concept of one or more regional centers for distance education within Africa (World Bank 1988, p. 111). Such centers might be launched as universities or develop into universities.

Looking across the range of educational levels, we find a variety of organizational structures for distance education. In nonformal education, distance teaching may be the responsibility of an agricultural information service or a health education unit within a government department. For some programs, cooperative structures have been developed that bring together specialist institutions to support a program of distance education. No obvious best choice among the options exists, but it is worth stressing their variety so that those planning new programs can make an informed selection. The best guide in choosing a structure may be to consider the relationships that a specialist program will have with other parts of the educational service and the best ways to foster those relationships. The teacher training program in Tanzania, for example, needed a structure that brought together the work of the teacher training colleges, the skills of the national correspondence institutions, and a field organization to support and supervise the work of trainees in the schools.

The most appropriate structure for a particular purpose may go beyond national frontiers. The Commonwealth of Learning, established by governments in 1988, is developing cooperative activities among countries and institutions and, by doing so, opening up new opportunities for sharing resources, widening access, and raising educational quality.

## What Success Has Been Achieved?

To examine the achievements of distance education we need to consider at least its internal efficiency and its external effectiveness, and at best some broader questions about its value as an educational process and the adequacy of what it has done in relation to the scale of educational needs.

The evidence on internal efficiency is mixed. If we take as a simple measure of efficiency the proportion of students who complete their courses, the findings vary widely. A number of teacher training projects where students were assured of promotion or improved status on completing their course had successful completion rates of over 80 percent (table 2.2). At the university level, where our fullest data come from rich countries, the British Open University finds that between 50 and 60 percent of its students eventually graduate. In contrast, some of the secondary-level schemes reaching out-of-school students have far lower completion rates, with disturbingly high dropout rates.

**Table 2.2** African Teacher Training Projects Using Distance Education

Country and date	Number of students enrolled	Students completing course		Students completing course and passing exam	
		Number	Percentage	Number	Percentage
Botswana 1968-72	608	539	88	No exam.	—
Kenya 1968-74	8,433	n.a.	n.a.	7,632	91
Kenya 1982-85	3,600	3,550	99	n.a.	88
Swaziland 1973-76	600	580	97	No exam.	—
Tanzania 1979-84	45,534	n.a.	n.a.	37,998	83
Uganda 1967-70	1,000	948	95	876	88
Zimbabwe 1981-88	8,720	n.a.	n.a.	8,000	n.a.

n.a. = not available

Sources: Botswana, Kenya 1968-74, Swaziland, Uganda: Young and others (1980, p. 34); Kenya 1982-85: Curran and Murphy (chapter 3); Tanzania: Mählick and Temu (1989, p. 27); Zimbabwe: Gatawa (1986, pp. 20,24).

The simplest measure of external efficiency is the cost per graduate. Here again we are short of data, but researchers have produced a number of case studies in higher education, using a standard format, that confirm that both industrialized and developing countries can produce graduates at one-third to two-thirds of the cost of doing so in a conventional institution (Perraton 1982, 1987). At the secondary level fewer data are available. Wolff and Futagami (1982) found that in Malawi, the cost per successful student studying at a distance was lower than that for boarding students in regular schools, but higher than that for day students. Data from Zambia suggest that

if the distance education program could achieve a successful completion rate of between 5 and 14 percent, its costs would be lower than those of conventional schools (Perraton 1983, pp 11-12).

Some findings on the effectiveness of using distance education for teacher training go beyond the narrow questions of cost effectiveness. Internal and external assessments, both of them relatively informal, concluded that the Swaziland scheme had succeeded in meeting its objectives of changing both curricula and methods (Young and others 1980, pp. 32-33). In Zimbabwe, the Ministry of Higher Education was sufficiently impressed with the results of the Zimbabwe Integrated National Teacher Education Course scheme that it has started to introduce a more permanent element of distance education in its teacher training programs. In Tanzania, the evidence suggests that the teacher training program has produced effective teachers (see Chale 1983; Mählick and Temu 1989).

Nevertheless, if we consider the programs' adequacy in terms of the need for trained teachers, they are open to the severest criticism. In Botswana, for example, the teacher training scheme that ran from the late 1960s to the early 1970s was designed as a once-and-for all crash solution to the problem of untrained teachers. Today, with a much expanded teaching force, some 2,500 teachers are still untrained (personal communication, J. R. Swartland 1989). Similarly, despite the running of two programs through the University of Nairobi in 1984, Kenya had 33,385 untrained teachers, 28 percent of the total (Curran and Murphy, chapter 3). Many educational planners have not been convinced of the legitimacy of distance education for teacher training.

I will now pose a broader set of questions that need to be on the record, however, I will not seek to answer them here. They concern the intrinsic quality of studying at a distance as opposed to studying face-to-face. We can and should ask whether students working in this way are getting as good an education as those working at school or college; whether distance education can be characterized by an open-minded dialogue and by a respect for cultural values; whether its students are enriched by the process of education in a way that leads to personal fulfillment; and whether they are equipped for their present or future roles at work, in their families, and in society as well as being credited with a paper qualification. Unless we ask these questions, we shortchange our societies by asking only about cost-effectiveness. Yet we are woefully short of data. At the same time we also need to ask these questions about conventional education. Our conclusion may well be that distance education cannot match the best of face-to-face education, but also that financial constraints mean that the best is rarely available.

### **What Are the Conditions of Success?**

Distance education is underresearched and we can draw only limited conclusions about the conditions for such success as it has achieved. We do not, for example, have enough data to resolve questions about the most suitable organizational structure for it, even though an ample choice of organizational models exists, especially in higher education, and we have considerable experience of their use. We can, however, draw four general conclusions from the available evidence.

First, distance education may have little chance of survival if its costs are higher than those of conventional education. Despite its capacity to reach students in remote parts of the country, add-on costs are often unrealistic for many African countries. Two

illustrative cases are the schools television service in Côte d'Ivoire, which closed down partly because its costs were proving insupportable, and the Radio Language Arts Programme in Kenya, which closed when U.S. Agency for International Development (USAID) funds were no longer available. In both cases the evidence on educational effectiveness was encouraging, children were learning well, but the costs were too high. This conclusion should not be pushed too far. Where distance education can raise the quality of secondary education, it may have a continuing role to play within schools, and its costs may be acceptable in relation to secondary budgets and in relation to the costs of alternative ways of raising quality. (If qualitative improvements reduce dropout rates, then they may reduce the unit cost per successful student even though they increase total expenditure.)

Second, the students' motivation is all important. Successful programs have generally been ones in which students could see clearly the benefits of their studies.

Third, the educational world has developed considerable expertise in the technicalities of distance education: about the production of materials that are likely to be effective; about the organization of support services for students; about the process of tutoring them; and about the value and methods of mixing educational media. The cost studies have demonstrated that we can get students through their examinations at costs that compare favorably with those for conventional education. Given the resources, there is adequate knowledge of good practice, both within Africa and beyond, to run programs that should be more effective than those we were beginning a quarter century ago.

Fourth, distance education demands resources. Some of the government-backed distance teaching institutions within Africa have been starved of them in a way that is understandable at a time of structural adjustment and chronic economic misery. However, the starvation may be an uneconomic use of resources when, with comparatively modest improvements in funding, considerable improvements in effectiveness could be achieved.

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# 3

## DISTANCE EDUCATION AT THE SECOND-LEVEL AND FOR TEACHER EDUCATION IN SIX AFRICAN COUNTRIES

*Chris Curran and Paud Murphy*

This chapter is based on six case studies of distance education in Ethiopia, Kenya, Lesotho, Malawi, Zambia, and Zimbabwe carried out in 1987 and 1988. World Bank research on education in Sub-Saharan Africa presents a clear picture of the urgent and extensive demand for education. Despite a substantial increase in investment in education in many African countries in the 1970s and early 1980s, a large unsatisfied demand for access to education persists (World Bank 1988).

The severe and continuing constraints on resources that are common to most parts of Sub-Saharan Africa have focused governments' interest in alternative ways to provide wider access to education. Many educators believe that distance education provides one solution.

There can be economies from the creation of distance education systems that combine radio and correspondence techniques and reduce (but do not eliminate) the amount of face-to-face interaction with qualified teachers. Such systems would extend education of reasonable quality to many more communities than could be reached any other way for the same price (World Bank 1988, p. 5).

Thus, we need to know more about the educational effectiveness and cost-effectiveness of distance education as it is practiced in Africa.

### The Study

While acceptance of the potential of distance education is widespread and many pilot projects have worked well, a gap exists between potential and actual use to solve education problems. Thus, we were particularly interested in investigating the problem-solving capacity and practical applications of distance education at the second level and for teacher education.

We chose to look at the systems of distance education in the six countries rather than to undertake the more usual media-based analysis (Jamison, Klees, and Wells 1978; Tiene and Futugami 1987). The reasons for adopting this approach were that our initial investigations revealed that while specific media, used singly or in combination, could have a useful role to play in the extension of education in Africa, for the most part the use of media is marginal. Moreover, isolating and measuring the contribution of various media to the learning process for most African students is difficult.

The critical questions we attempted to address were as follows:

- Has distance education widened access to second-level education in Africa?
- Has it done so in a cost-effective way?
- Has it proved educationally effective?
- Does it provide a cost-effective alternative to conventional programs?

Distance education programs in the six countries can be grouped into three broad categories:

1. Programs for teacher education, either at a formation level or for in-service development;
2. Programs for second-level education that compensate for the severe shortage of qualified teachers in many African countries;
3. Programs that are intended to reach a wider adult audience.

Note that the forms of distance teaching used in the programs vary somewhat, especially in relation to their combination with other forms of education. For example, teacher education typically involves distance teaching in combination with residential courses or field visits; study group programs involve the use of mentors or instructors other than qualified second-level teachers; and the provision of distance teaching for independent adult learners is substantially text-based, often with minimal use of face-to-face instruction or radio.

### **Problems in Education**

The number of school age children in Africa is continuing to grow at a rate in excess of 3 percent annually and the demand for education at all levels will continue to expand. As governments are meeting the target of universal primary education, the number of students seeking education at the second level is increasing. However, budget constraints caused by rapid population growth have affected both access to education and the quality of that education (World Bank 1988).

In the six countries studied, school age populations are increasing at rates ranging from 2.8 percent annually in Ethiopia to 4.3 percent in Kenya. In all six countries the number of children entering and completing primary school has increased dramatically during the past twenty years. Between 1970 and 1983, for example, the annual increase in primary school enrollment in the six countries ranged from 3.5 percent in Lesotho to 10.8 percent in Ethiopia. By 1983 the gross primary enrollment ratio was 100 or more in four of these countries (exceptions were Ethiopia at 38 percent and Malawi at 58 percent) (World Bank 1988).

Despite increases, the gross secondary enrollment ratios are still low, ranging from a high of thirty-nine in Zimbabwe to a low of four in Malawi. The transition rate from the last grade of primary school to the first grade of secondary ranged from 7 percent in Malawi through 45 percent in Lesotho to 93 percent in Ethiopia. The actual numbers of children seeking a secondary education is increasing each year, with the consequent parental pressure on ministers and departments to provide it. In Zambia, 112,000 of the children who completed primary school in 1985 could not get a place in secondary school. That number is projected to grow to 250,000 by the year 2000 (Kelly 1987).

Similar problems face Kenya, Lesotho, and Malawi. In Zimbabwe, the government's commitment to provide secondary school places for all children completing primary school is placing great pressure on the education budget, which now consumes more than 20 percent of the government's annual expenditures. Kenya is spending more than 30 percent of its budget on education.

Educational planners in these six African countries therefore face an acute dilemma: should they provide the same resources for a smaller percentage of the population of school going age, or should they adopt more cost-effective ways of providing education to the numbers who seek it? It is in this latter connection that the use of distance education is of interest.

The governments of the six countries use distance education for the three educational categories mentioned earlier, and these are examined first. Next, the chapter discusses institutional structures, management and administration, media and reading methods, and cost-efficiency measures. Finally, some general conclusions are drawn.

### Distance Education for School Leavers

Three countries, Malawi, Zambia, and Zimbabwe, offer special courses for primary school leavers. All recognize that recent primary leavers need more support than adults and all have established systems that provide a structure and supervised learning.

The basic teaching-learning package is the same in the three countries. On enrollment students receive printed correspondence courses and access to a marking service. They then register in a local study center (called an open secondary class in Zambia) where they meet every day. They are supervised by individuals who are either primary school teachers or reasonably well-educated adults, and they may get the opportunity to listen to radio programs or taped instruction. Table 3.1 provides information on the study centers in the three countries.

**Table 3.1 Characteristics of Study Center Programs in Malawi, Zambia, and Zimbabwe**

Organizing institutions	Supervisory authority	Learning materials design	Student numbers <sup>a</sup>	Supervisors		Training given	Building
				Numbers	Background		
Malawi College of Distance Education (MCDE)	Ministry of Education	MCDE teacher	14,000	252	Primary	Some	110 study centers, over 50% specially built
Zambia National Correspondence College (ZNCC)	Ministry of Education	ZNCC teacher	14,100	247	Primary	Rare	Primary school classrooms during school hours
Department of Nonformal Education (DNFE)	DNFE	Private correspondence colleges	41,000	1,022	Five ordinary level passes	None	Primary and secondary school classrooms after hours and other buildings

a. 1987 figures.

Source: Author's research.

*Effectiveness*

In five of the six countries, examination authorities do not analyze the results of private candidates by mode of study or by institution. Malawi is the exception. Table 3.2 gives the results of students in regular secondary schools and in study centers in 1985-87.

**Table 3.2** Malawi Junior Certificate Examination Results, 1985-87

<i>Mode of study</i>	1985		1986		1987	
	<i>Number taking exam</i>	<i>Percentage passing</i>	<i>Number taking exam</i>	<i>Percentage passing</i>	<i>Number taking exam</i>	<i>Percentage passing</i>
Regular secondary school	6,518	75	6,955	74	7,108	80
MCDE students at study centers	6,049	15	8,160	17	8,388	24

MCDE = Malawi College of Distance Education

Source: Malawi Certificate Examination and Testing Board.

Candidates from secondary schools achieved an average 75 percent pass rate, compared to an average 19 percent pass rate for candidates from study centers. The results must be treated with caution for a number of reasons, including the fact that Malawi College of Distance Education (MCDE) students perform less well than secondary school students in the primary school leaving examination, and are therefore less well prepared for secondary studies. In addition, a few MCDE students do not sit for six subjects or more, and are thus not eligible for a full certificate.

An analysis of the results in eight study centers in Zambia showed pass rates in excess of 30 percent, while one study center in Zimbabwe showed pass rates well in excess of the average for regular secondary schools.

*Costs*

Cost information is not easily available. An analysis of the MCDE'S costs in the 1985 study indicated that the recurrent cost per student was less than one-fifth of the recurrent cost per student in a regular secondary school, and that the cost per examination pass was about the same. As the results of MCDE students have been improving, the cost per examination pass in 1988 was almost certainly lower than the cost of an examination pass in a regular secondary school.

The costs of Zambia's study center system in 1988 were affected by economic shortages, particularly the shortage of paper, which made the commercial cost of printing inordinately high. However, Perraton (1982) showed that the open secondary

classes would be cheaper than conventional secondary schools if more than 14 percent of the students enrolling passed the examination. The indications from the eight study centers for which data are available are that more than 30 percent of students pass.

### *Proposals*

The experiences of Malawi, Zambia, and Zimbabwe show that the system can work and could be less costly per student enrolled than the conventional alternative. The system's strength is that despite having to work with less able students and being starved of resources, students do learn. The three countries currently using the system could increase the numbers receiving a secondary education dramatically if they provided all junior secondary education by this means, and used existing conventional schools for senior secondary education only. In Malawi, for example, the 24,000 or so places in conventional secondary schools now spread over the full four years of secondary education could be devoted to the two senior years, and all primary school leavers could be enrolled in the Malawi College of Distance Education for two years. Zambia would move closer to its goal of nine years of basic education for all its children if the last two years were provided in open secondary classes.

Other countries could dramatically increase access to second-level education by setting up study group systems. However, quality is vital. In an ideal system, students would:

- Meet daily in buildings equipped for education,
- Study good quality printed materials,
- Listen to instructional radio,
- Benefit from the guidance of trained people,
- Receive general supervision from a prestigious distance education institution,
- Benefit from significant community involvement.

### **Government Support for Adult Second-Chance Learners**

One of the problems many African countries inherited at independence was a large number of able people who did not have access to second-level education. As many of them were working and could not easily get to night classes, distance education provided a ready solution. The five institutions in Ethiopia, Kenya, Lesotho, Malawi, and Zambia were all initially established to cater for adults seeking a second-chance education. Four of the five still offer courses for adults. The Kenya School of Distance Studies (KSIDS) has ceased to offer courses for adults (table 3.3).

All the institutions offer correspondence courses that they have designed and produced, and access to a marking service for assignments. They all also design their own radio programs, which the national or educational broadcasting service helps to record and transmit. All the institutions have experimented with face-to-face support, including day-long courses, weekend courses, and courses run by secondary teachers in local secondary schools. However, none of the institutions has found a satisfactory mode of face-to-face support.

**Table 3.3** Adult Enrollment in Distance Education Courses at the Second Level in Four African Countries, 1987

<i>Country</i>	<i>New enrollments annually</i>	<i>Support offered</i>	<i>Level</i>
Ethiopia	500	Print, radio	Senior secondary
Lesotho	500	Print, radio, face-to-face	Senior secondary, junior secondary
Malawi	2,000	Print, radio, junior secondary	Senior secondary, junior secondary
Zambia	1,000	Print, radio, junior secondary	Senior secondary, junior secondary

Source: Authors' research.

### *Effectiveness*

Determining how well students studying at home do in examinations is very difficult as many students only sit for one or two subjects, and examination boards only provide information on full examination passes. However, the indications are that many students do not sit the examinations. A cohort analysis carried out in two countries shows that fewer than 5 percent of enrolled students had sat for the examinations after five years of study, and up to three-quarters of the students had stopped studying completely (table 3.4). These results are discouraging.

**Table 3.4** Progress of Students Enrolled in Examinations Courses in Two African Countries

<i>Institution</i>	<i>Number of students</i>		
	<i>Enrolled in 1983</i>	<i>Sitting for exam in 1988</i>	<i>Still studying in 1988</i>
A	148	4	35
B	1,126	44	112

Source: Enrollment records in distance teaching institutions.

In Malawi, a comparison of students studying on their own with students getting some face-to-face support revealed that in 1985 fewer than 1 percent got a full

certificate. Note, however, that many of the students studying on their own did not sit for the six subjects needed for a full certificate.

### *Costs*

The costs of supporting adult second-chance learners are very low as students are not generally provided with face-to-face support and the only direct costs are the marking and administration costs. MCDE incurred some MK 2.3 in costs for marking, support, and administration for each adult second-chance leaver, compared with MK 22.3 for study center students. However, the printed materials and radio programs cost an additional MK 50 each year, and the initial investment in developing and testing print and audio self-instructional materials was considerable. Despite the relatively low costs, student fees do not cover them. For example, in Malawi the annual cost per student in 1985 exceeded MK 60 and the total fees paid were MK 30.

### *Proposals*

Government-supported provision of distance education for adults is small: an estimated 6,000 adults are enrolled in courses at the second level in the six countries. Many more may be enrolled with private correspondence colleges, particularly in Kenya and Zimbabwe, which do not have government-supported programs, but numbers are not available. Clearly the programs for adults are not producing examination passes. The explanation could lie in students' backgrounds, or lack of motivation, or lack of support and merits further investigation. However, the cost per student is very low and the continued provision of distance education programs at the second level for adults is likely to have a positive and immediate effect on development policies. Employed adults would be more able to pay for the cost of expanding distance education programs through increased fees. Finally, where course materials have been developed for use by school age children, their extension for use by adults should for the most part prove relatively easy.

## **Government Support for Teacher Education**

Three of the six countries have used distance education to provide special courses for teachers. Zimbabwe, through the Zimbabwe Integrated Teacher Education Course (ZINTEC), has used distance education since 1981 to provide pre-service teacher training. KSDS (since 1969) and the Lesotho Distance Teaching Center (LDTC) (since 1978) have used distance education for in-service training of unqualified teachers. The learning package is similar in each of the three countries: printed self-instructional materials, residential courses in teacher education colleges, radio programs to supplement the correspondence courses, and classroom supervision (Murphy 1981; chapter 8 of this book).

The emphasis given to each element varies from country to country. In Lesotho, for example, the residential courses occupy four weeks per year, in Kenya seven weeks per year, and in Zimbabwe four months at the start of the four-year course, four months at the end, and four weeks per year for three years. Similarly with radio, Kenya and

Lesotho have weekly programs for most subjects, but Zimbabwe only has one program a week.

Average yearly enrollment in Lesotho is 300 to 500 teachers, and since 1980 over 1,100 teachers have been trained. In Kenya, 4,000 teachers are currently enrolled, and more than 3,000 teachers have graduated since 1984. In Zimbabwe, by 1986 about 8,000 students had registered for the ZINTEC program and almost 2,000 had completed their training.

### *Effectiveness*

In 1982, 3,600 teachers were enrolled in the Kenyan program. In 1985, 3,550 took the examination, of which 88 percent passed. The average pass rate for teachers studying using traditional methods was 85 percent. Lesotho also reports excellent results: 87 percent of those enrolled in the program graduated in 1984. Preliminary results for the ZINTEC program are also reported to be good.

### *Costs*

Obtaining detailed information on costs proved difficult. A 1982 study of the costs of the Kenya teachers' program in 1977 concluded that it was expensive for the number of teachers being assisted. At that time the program was handling 342 new entries and 2,404 continuers. Today it is catering to 4,500 teachers and the real cost per student is probably much less.

### *Proposals*

The experiences of Kenya, Lesotho, and Zimbabwe demonstrate the effectiveness of teaching methods to qualify teachers. In Kenya and Lesotho underqualified, in-service teachers are helped. In Zimbabwe newly recruited teachers are assisted. The key elements of a successful distance education program for teachers include the following:

- Initiating a partnership between a distance education institution and teacher education college(s);
- Establishing a nationally-recognized certificate entitling teachers to higher salaries and grades;
- Using self-instructional printed material for the bulk of the instruction;
- Having regular residential courses in teachers' colleges;
- Encouraging the support and involvement of inspectors and headmasters;
- Ensuring some field supervision of teachers.

The emphasis to be given to any element will depend on the background and experience of the student teachers.

## **Institutional Structures for Distance Education**

With the exception of Zimbabwe, the countries studied have established special distance teaching units or institutions offering second-level (including teachers) courses.



In five of the countries private correspondence colleges, either indigenous or branches of multinational enterprises, provide courses directly. In all the countries students register with private colleges. While the numbers enrolled are not available, they are reported to be particularly high in Kenya and Zimbabwe. Table 3.5 shows the different publicly-funded institutions in the six countries. With the exception of Kenya, where the institution is part of a university, each is part of a ministry of education. As the table shows, most of the institutions concentrate on providing courses at the second level. However, Lesotho Distance Teaching Center and the Department of Non-Formal Education in Zimbabwe also offer support at more basic levels.

**Table 3.5 Public Organizations Offering Courses Using Distance Education at the Second Level in Six African Countries**

Country	Institution	Status	Courses
Ethiopia	Distance Education Division	Division of the Department of Adult Education, Ministry of Education	Senior secondary
Kenya	School of Distance Studies	School of College of Adult and Distance Education, University of Nairobi	Primary and adult teachers in-service
Lesotho	Lesotho Distance Teaching Center	Semi-autonomous institution in Ministry of Education	Junior and senior secondary, primary teachers in-service, rural adults, literacy
Malawi	Malawi College Distance of Education	Department of Ministry of Education	Junior and senior secondary
Zambia	Zambia National Correspondence College	Part of Department of Continuing Education, Ministry of General Education	Junior and senior secondary
Zimbabwe	Zimbabwe Integrated Teacher Education Course	Within Teacher Education Department, Ministry of Higher Education	Teachers pre-service
	Department of Non-Formal Education	Department of Ministry of General Education	Junior and senior secondary, literacy

Source: Author's research.

### *Autonomy*

All the publicly-funded institutions operate within the policy guidelines and administrative systems of the parent university or government unit. In the key area of staffing, none of the institutions reviewed has autonomy. This is unsatisfactory on two counts: first, staff numbers, levels, and conditions are determined by officials in the

parent ministry or university who may not understand how the roles of staff differ from those in schools; and second, the parent organization often does the recruiting without involving the staff of the distance education institution.

The institutions also have little, if any, financial autonomy. Each operates within government or university budgetary and allocation procedures. The fees, which are returned to the central government, bear no relationship to costs, and are set by the government.

### *Status*

The governments rarely attach high status to distance teaching institutions. While all educational institutions in Africa have funding problems, the problems of these institutions are particularly severe. The allocation of resources per second-level student studying at a distance in Malawi or Zambia, for example, is about one-fifth of the allocation to school students. Despite the growing body of evidence that teachers trained at a distance perform as well as teachers trained in conventional colleges, governments are often reluctant to acknowledge this by providing equivalent salaries.

The reactions of other educational institutions confirm this low status. Most examinations bodies charge private candidates a fee for sitting the examination, but do not charge school candidates. When analyzing the results they provide a very detailed breakdown for schools, but only one examinations body in the six countries provides an analysis of private candidates' results.

### *Proposals*

As a result of their low status, inadequate resources, lack of autonomy, and, in most cases, multiple objectives, the institutions find it difficult to attract and retain good quality staff. Out-of-date courses continue to be used. These are often poorly reproduced on low-quality paper in insufficient numbers. Organization is generally poor. Where face-to-face support is provided, the providers rarely receive adequate or appropriate training. Thus, it is hardly surprising that students do not perform as well as their counterparts in conventional schools, and that as a result, the distance education institutions lose more status and receive fewer resources. If this self-perpetuating cycle is to be broken, a number of steps must be taken to improve status, limit objectives, increase resources, and provide more autonomy.

Although status should be earned over time, governments can adopt measures to help. The location of an institution may be important. Programs operating from universities may have higher status than programs operating out of adult education divisions. Institutions with some independence and prestigious boards of management may have more status than institutions operating as part of a ministry of education. Publicly-funded institutions may have more status than private institutions.

Institutions with a range of objectives and target groups may find it difficult to set their priorities. Development objectives and target groups should be few in number and precisely defined.

Each institution has the potential to generate a significant proportion of the resources it needs to operate successfully. However, governments must allocate sufficient

resources, particularly in the beginning, to enable institutions to develop the best materials and services.

Institutions must be given autonomy in financial management and in staffing. They should set their fees at a level that covers the variable costs of student support services and materials.

### **Management and Administration of Distance Education Programs**

Effective management is central to all good education practice; however, it is vital for distance education because the activities involved in developing and teaching distance education programs differ in key respects from conventional education (Rumble 1986). The range of activities involved in distance teaching is wider, and the skills required to develop, produce, and deliver courses are more diverse than those typically found in conventional education. The need to manage these diverse and integrated activities has led some analysts to compare distance education to industrialized production (Peters 1973).

The provision of distance education programs involves coordinating a wide range of activities of varying complexity. In the six countries, the activities usually include the following:

- Writing and editing course texts, study guides, and radio scripts;
- Typesetting, printing, and binding course texts and other printed materials;
- Producing audio tapes for radio transmission;
- Organizing a network of study centers, typically based on part-time use of external facilities;
- Recruiting and managing part-time tutors;
- Distributing course texts and other materials to individuals and groups sometimes widely dispersed geographically;
- Assessing student progress through correspondence-based marking services;
- Controlling financial activities;
- Recruiting and registering students;
- Maintaining student records;
- Evaluating program effectiveness.

Managers' failure to manage these activities inevitably leads to problems of the following kind:

- Delays in writing and producing course materials;
- Inadequate course materials in terms of subject content or, more commonly, instructional effectiveness;
- Poor integration of the different components of courses, that is, written texts, face-to-face sessions, radio transmissions;
- Failure to deliver course materials to all students or failure to deliver on schedule;
- Excessive delays in marking and returning assignments to students;

- Inadequate training and/or monitoring of supervisors and tutors.

The authors' encountered all these problems to a greater or lesser degree in the course of their field studies. These and the many other failures that result from poor management inevitably lead to higher dropout rates, poor examination performance, and wastage of scarce resources.

### *Management Expertise*

Managing even small distance education systems imposes unremitting demands on practitioners. Individuals with the required expertise to meet these demands are seldom readily available, which may help account for the number of unfilled posts in some of the institutions visited. For example, in the School of Distance Studies in Kenya, only seven of thirteen academic posts were filled in 1987, while the Zambia National Correspondence College had five vacancies among academic staff, two senior administrative vacancies, and five clerical vacancies, representing some 12 percent of all assigned posts.

In the distance teaching institutions examined in this survey, managers recognized the special complexities of managing distance education programs; however, in only two of the six countries had the director had any management training. Thus, managers in distance teaching institution and policymakers responsible for staffing should consider:

- Reviewing the current patterns of resource expenditure to fill key posts;
- Introducing measures to avoid turnover of experienced staff;
- Reviewing procedures to ensure the early recruitment of replacement staff to fill vacant posts;
- Providing staff development programs, including on-the-job training, to provide a pool of in-house candidates from which staff losses could be replenished.

### *Management Structures*

The degree of autonomy that distance education institutions enjoy varies. The administrative structures within which distance education systems operate has a significant influence on the system's management as a whole and on program effectiveness.

In each of the six countries, governments have established and continue to fund institutions that provide distance education. As already pointed out, the relationship of these institutions to the government is close, which has certain advantages. At a minimum, it helps ensure that the distance education institutions remains responsive to the priorities of policymakers in the ministry. However, a high degree of centralization inevitably imposes constraints on managers. Yet disadvantages also result from this close relationship. As mentioned earlier, in a number of the institutions visited, managers have no autonomy in the key area of staff. The central department determines the number of staff employed, together with their grade and conditions of appointment.

The situation with regard to policy formulation appears similar. These constraints on managers' autonomy may account for the lack of specific program objectives.

### *Financial Control*

The financial control of activities is an important task in educational management. The task is more important in distance education (Rumble, Neil, and Tout 1981) because the range of items and activities on which expenditure is incurred is typically wider than conventional education, where a high proportion of recurrent costs, especially teachers' salaries, is largely fixed in the short run (Coombs and Hallak 1987).

In the six countries, each institution is subject to the allocation process of its parent organization and has little autonomy in financial matters. Few institutions pay directly for goods and services received, and fee arrangements are also centrally controlled. As a result, little financial analysis is available, for example, we could not get figures on the cost per student enrolled or the cost per student passing examinations for any institution.

While education policymakers should consider the extent to which ministries can delegate responsibility for financial control to senior management in distance education institutions, they are only likely to do so if managers can demonstrate their ability to control activities with efficiency and prudence. One step in this direction would be to allow institutions to set their own fees. Policymakers should also consider allowing distance education institutions to retain a substantial part of fees received as a major component of their total income. This should encourage greater attention by managers to the cost efficiency of their operations.

### *Student Records*

All distance education systems must maintain student records (Friedman 1981). Typical records include details of

- Students registered,
- Fees received,
- Course texts and other materials distributed to students,
- Assignments returned by students,
- Marks awarded by tutors,
- Student attendance at face-to-face sessions,
- Examination results.

Well-maintained and easily accessible records are a vital source of information for managing programs efficiently and analyzing institutional effectiveness, including progress by student cohorts, dropout rates, and examination results. Such records can also be used to assess the progress of individual students, especially those experiencing learning difficulties. Early identification of such difficulties allows the staff to take remedial action in time to prevent students from dropping out.

In most well-developed distance education systems, records of this kind are now kept in a computer database maintained on a mainframe or mini-computer. The rapid development of hard disk microcomputer technology and database software has now brought this technology within reach of systems with small and modest resources.

With the exception of Lesotho and Malawi, most records in the six countries studied are kept manually. Some are well kept, but for the most part, records are difficult to

access and do not seem to be used in any systematic way to analyze student progress or assess institutional effectiveness.

Distance education institutions should examine the feasibility of using a microcomputer-based student record system. A common database format could have the advantage of providing a basis for comparative analysis of distance education systems in different countries.

### *Evaluation of Programs*

As distance education involves substantially less face-to-face communication between students and teachers than conventional education, distance educators have less access to direct information on students' progress and programs' effectiveness. Thus, distance education practitioners must make the effort to undertake regular and systematic evaluation of students' progress and of other key aspects of their programs, else they are effectively working in the dark (Holmberg 1985; Mace 1976).

Some evaluations of the activities of the institutions engaged in distance education in the six countries have been undertaken. A number were one-time exercises that were components of aid projects. Two of the institutions examined, the Lesotho Distance Teaching Center and the Malawi College of Distance Education, have special research and evaluation units that pre-test printed lessons and radio programs and collect information on student numbers and progress. The Lesotho Distance Teaching Center undertakes a regular cohort analysis of students' progress and of their performance in examinations. On the whole, however, evaluation is neither sufficiently extensive nor regular to monitor institutional effectiveness in meeting key program objectives.

The institutions should consider undertaking regular and systematic evaluation of their activities to provide a more effective program with a high rate of student success. The key aspects should include:

- The rate of, timing of, and reasons for student dropout;
- The percentage of registered students attempting examinations and the percentage passing, both for individual subjects and in the examination as a whole;
- The percentage of students submitting written assignments and the marks awarded;
- The turn-around time involved in marking and processing assignments;
- The actual distribution dates for course materials compared to scheduled dates;
- The comparison of tutors marking of assignments to ensure uniformity of standards.

### *Access and Admissions Policies*

Many distance teaching systems throughout the world operate an open admissions policy whereby students are admitted to programs without any prior qualifications. In some countries this policy extends to third-level education. Their results indicate that students with modest prior experience or qualifications can succeed in learning at a distance given adequate courses and support services. Note, however, that an open entry

policy imposes specific demands on distance education institutions. At a minimum, it means that institutions admit at least some students who are academically weaker, yet they are required to learn in a manner arguably more demanding than conventional education. For these reasons, most distance education institutions that operate an open door policy invest considerable resources in developing course materials, adopt a multimedia approach to instruction, and provide substantial tutorial and counselling support.

In general in the three countries that provide distance programs for recent primary school leavers, access is more open than access to conventional secondary schools: applicants are only required to have passed the primary school leaving examination. In Malawi, for example, the number of students entering the Malawi College of Distance Education each year exceeds the numbers entering conventional secondary schools. Similarly, most institutions accept adults provided they can demonstrate an ability to cope with the courses. The main barrier to participation may be the fees charged by all the institutions.

Access to courses for teachers is more restricted: applicants are normally admitted on the basis of academic qualifications and on the recommendation of school principals or school inspectors.

Practitioners could consider restricting entry to candidates selected on the basis of prior qualifications or superior academic ability. Such a policy would reduce the number of students to be accommodated and result in higher pass rates. It would, however, inevitably restrict access for less able or academically disadvantaged students.

The disadvantages of a restrictive entry policy could be minimized by providing open entry to a qualifying course. Only those students who succeed in this preliminary program would proceed with subsequent courses. Not only would this reduce dropout and examination failure rates, but it would permit unsuccessful students to withdraw with less of a sense of failure.

## **Media and Teaching Methods**

Distance education uses a wide variety of media (Bates 1982) to convey the educational content of courses, to provide a means of communication between students and tutors, and to administer programs. Some 100 programs around the world use print, radio, television, and the telephone, and the use of sophisticated technologies, in particular computers, interactive video disks, and satellite communications, is growing.

### *Choice of Media*

The factors that affect the choice of media and teaching methods in distance education systems include the objectives of the institution providing the program, the scale at which it operates, the number of students, and the students' geographic dispersion. Other factors are the specific educational goals of the course, and the degree to which students have access to the particular medium or teaching method.

The technologies used in the six countries are relatively simple. Even media usually considered low cost, such as audio tapes, are only rarely used, primarily for reasons of inaccessibility. As in most distance education programs throughout the world, print is

the dominant medium. In most cases printed texts are supplemented by written assignments and/or face-to-face teaching. Radio is used in most of the programs, but for second-level courses typically occupies only a very small part of the total study time. Other technologies used include limited use of audio tapes and science kits.

None of the countries we visited uses television, video tapes, telephone conferencing, computer-based instruction, video disks, computer conferencing, or satellite links. The technologies used can be characterized as relatively simple from a technical perspective, and potentially readily accessible to students.

### *Course Writing*

As printed texts are the primary medium of instruction for distance teaching in the six countries, writing, editing, and producing them is central to course development activities. Some distance teaching institutions, such as the Lesotho Distance Teaching Center, employ full-time staff to write texts. Others employ specialists, either full-time or part-time. Most of the institutions employ editors experienced in the form and presentation of distance teaching texts either to work with the writer or to edit the text subsequently. Editors are usually employed full-time.

Employing writers on a full-time basis ensures that a permanent core of experienced specialists familiar with the institution's approach to instructional design and text layout provides continuity to the program as a whole. However, the disadvantages of this approach are that it adds to the overhead costs, constrains the institution's flexibility in responding to emerging needs, and can create redeployment problems after the initial course development is complete. The alternative is to employ writers on a part-time or contract basis. This solution is particularly appropriate for smaller institutions.

The success of this approach depends on the availability and commitment of external specialists of the required caliber. Some of the institutions visited had experienced difficulties in this connection, for example, the principal of one college claimed that he had invited nine specialists to write the initial course unit on local history, but that none of them had produced a satisfactory text. One institution that had used both in-house and external course writers claimed to have encountered long delays in the writing of texts and increased management problems when using external writers.

Clearly the use of external writers requires an effective management system. Institutions need to pay particular attention to the following:

- Specifying course content and learning objectives for individual course units ahead of time;
- Agreeing on schedules for the delivery of text on a phased basis so that delays can be identified at an early stage and appropriate action taken;
- Providing for regular communication between the writers, editors, course leader, and course team (where the latter exists).

An alternative approach to course writing that one institution used was to bring together a group of subject specialists for a short period to write a text under the direction of an experienced editor. This approach works best when the text format is



specified in advance, the team leader is experienced in text production, and the distance teaching text is essentially a guide ancillary to an existing textbook (Leech and Murphy 1977).

Whatever approach an institution adopts for course writing, texts must be edited from the students' perspective. Individuals with the skills required to edit distance teaching texts require special training.

### *Course Production*

Once written, course texts have to be typeset, printed or otherwise reproduced, and delivered to students. This process may also involve the storage and packaging of texts and provision for stock control.

As print is a technically simple medium, the need for effective management systems to develop and deliver printed texts is often underestimated. Delays in sending texts to students and failure to deliver texts to all students on the course was a recurrent problem in a number of institutions. These problems, although common to many distance teaching institutions in other countries, are nonetheless serious. They effectively undermine the process of distance teaching.

In the institutions visited, course texts are generally typed on manual or electric typewriters. However, one institution had introduced computer-based wordprocessing. Most texts are printed or otherwise reproduced directly by the distance teaching institution or its parent organization. Two institutions contract out a substantial proportion of their printing work to commercial printers. The most common form of reproduction is offset-litho, however, typed stencils are also used, and one institution uses photocopying for small runs.

Several institutions had problems with maintaining equipment in good working order and in recruiting replacements for trained staff. As a consequence, facilities were operating at output levels considerably below their potential. Managers could consider introducing regular maintenance procedures to try and avoid breakdowns.

### *Face-to-Face Teaching*

The separation of the teacher from the student is the most common characteristic of distance education. In Africa, as elsewhere, this separation is rarely absolute; usually provision is made for at least some face-to-face teaching or student-tutor meetings. The degree of this face-to-face communication varies within and between the six countries; however, three distinct categories can be identified:

- Students are provided with course materials and may submit assignments to tutors, but there is no or only occasional face-to-face communication with tutors (Ethiopia, Lesotho, Zambia);
- Students attend some residential and day courses (Kenya, Lesotho, Zimbabwe);
- Students participate daily in study groups with supervisors on hand to help them (Malawi, Zambia, Zimbabwe).

The form of face-to-face teaching is closely related to the character of the student group, for example, adult learners, who are typically widely dispersed, independent

students, attend face-to-face meetings only rarely if at all. Attendance at residential courses is confined almost exclusively to the education of teachers; and the study group approach is used primarily for recent primary school leavers.

Students at study centers are supervised by people who are typically not qualified second-level teachers. In essence, the role of the supervisor (or "mentor" in Zimbabwe) is to assist students with nonacademic matters and to help them study the printed texts and learn from the radio programs. Supervisors also have an important role in maintaining discipline.

Qualified teachers usually mark students' assignments; however, Zambia is operating an experimental program in which supervisors mark assignments.

The role of the tutor in distance education programs differs from that of the teacher in conventional education. The primary role is to support the students in their study of the texts and other course materials. In many distance education systems, tutors who meet the students relatively infrequently tend to act as teachers, presenting lectures that are often poorly integrated with the course materials. Tutors are generally recruited from conventional education on a part-time basis.

Both full-time supervisors and the part-time tutors need special training that should be backed up by regular monitoring and supervision. For supervisors, this means an intensive initial orientation course, regular visits to study centers by inspectors to oversee their work, and annual in-service courses to reinforce good techniques and to build up an *esprit de corps*. Tutors also need orientation and monitoring. A substantial proportion of tutor-marked assignments should be pre-marked, preferably by course writers, to ensure uniformity of marking standards.

### *Radio*

Radio, which has a long established role in continuing education, is an effective medium for distance teaching (McAnany 1973; Purdy 1980). Radio's advantages are that it is inexpensive relative to other nonprint media, it can reach remote locations, programs can be broadcast as learners are studying, it can introduce and illustrate problems, it can make students aware of educational courses, and it can inspire students (Bates 1982). Also, in Africa national broadcasting systems are well disposed to education. Not surprisingly, therefore, the six countries' distance education systems all use radio, albeit in some cases rarely, as an essential teaching component.

Radio programs vary in format and content, however, the following are common:

- Programs for registered students directly related to learning materials, for example, readings and dramatized presentations from set texts;
- Explanatory talks and revision of mathematics and the sciences;
- Documentaries on history, geography, and the social sciences;
- Magazine-style programs to keep students up-to-date with course developments;
- Programs for a wider audience related to nonformal education.

The approach to program development varies. Where programs are not integrated with other course materials, radio producers have considerable freedom in their approach to program making. In the Lesotho Distance Teaching Center, for example,

which produces five and a half hours of program time per week, radio producers are responsible for writing radio scripts, selecting background music, producing the program, editing the tapes, and often providing the narration. The producers devise the programs after they have received copies of the course texts and consulted with the course writers, as necessary.

Where radio programs are integrated closely with other teaching materials, academic staff usually determine the content of programs. In Zambia and Ethiopia, for example, academic staff prepare radio scripts and pass them on to an educational broadcasting unit, which then produces them.

Discussions with practitioners and students in the six countries suggest that radio is not achieving its educational potential. Apparently even in those countries in which institutions devote a good deal of time to preparing and testing programs, students do not use them. The reasons advanced include programs broadcast at the wrong times, programs not relevant to the syllabus, no receiver available, and, very commonly, no power source available.

Managers must establish why radio programs are not reaching the students and identify ways to overcome these problems. They should also consider how to use radio creatively to reach out to potential students and the community at large, thereby raising the public's awareness of the institution's activities.

### *Audio Tapes*

Audio tapes are an effective, low-cost, and widely used medium for distance teaching (Bradley 1982; Kelly and Ryan 1983). Unlike with most other media, ordinary teachers with no experience in media production can produce audio tapes. In addition, audio tapes do not require expensive production facilities or transmission networks. They are also very flexible: they can be used to convey course content; as a means of spoken communication between tutors and students, for example, in counselling students; or to provide additional tutorial support to weaker students. In the six countries examined here, they would be especially useful for students who have to learn subjects in a second language in which they have only limited reading ability.

In practice, audio tapes are used only exceptionally in these six countries. A few institutions have used them on an experimental basis. One college in Zimbabwe, for example, made tape players available to students. However, the college claimed that the problem of ensuring a regular supply of batteries led to the experiment's termination.

Distance education practitioners should consider how they might use this medium to improve the quality and availability of distance education in these countries. In particular, they might consider the possibility of providing players at centers for use by groups of students.

### **Cost-Effectiveness**

A range of studies on the cost-effectiveness of distance education is available. Many of these studies compare the costs of distance education courses with comparable

programs provided through conventional education (Jamison, Klees, and Wells 1978; Perraton 1982; UNESCO 1977; Wagner 1982).

The results have varied from one study to another, but taken as whole, these studies show that distance education has the potential to be more cost-effective than similar programs provided through conventional education, and in a number of cases has proved so in practice. In conventional education, recurrent costs rise more or less in line with student numbers. Teachers' salaries, which usually account for a high proportion of total recurrent costs, are outside the control of school managers. In conventional education, therefore, while the costs of teaching students can be predicted with a high degree of accuracy, the measures that managers can take to control unit costs are quite limited.

The structure of costs in distance education is distinctly different, being characterized by high fixed costs for developing the courses and producing materials, and in some cases for operational overhead, on the one hand, and low variable costs relative to conventional education on the other. Many costs in distance education are less predictable than in conventional education. They are strongly influenced by such factors as the type of media used, the range and quality of courses, and the extent and quality of student support services provided.

Thus, the costs of distance education projects must be carefully appraised prior to implementation. Too many projects are "undertaken in hopeful anticipation" and "evaluated in rueful retrospect" (Vaizey 1972). Distance education programs also require regular analysis of costs to ensure the activities remain within the institution's resource constraints. Failure to observe this precaution results in the abandonment of programs as a whole or in the curtailment of important aspects of programs, such as weekend schools, rural study centers, or face-to-face teaching.

The data to support a full-fledged cost study of the distance education systems in the six countries are not available. Nevertheless, on the basis of the available data and discussions with practitioners and others, we can draw some tentative conclusions about costs and suggest ways to improve the cost-efficiency of certain activities.

### *Course Development*

In distance education, the various media used to convey the content of courses in effect replace to some extent the classroom teaching of conventional education. Developing and producing course materials or buying and adapting them is one of the primary tasks of distance education institutions and often consumes a substantial proportion of their resources.

Another major expense, this one associated with using texts, is the cost of reproducing multiple copies and delivering them to the students. In some countries, this problem is exacerbated by the increasing cost of paper and the scarcity of foreign currency needed to import paper.

As already mentioned, fees often bear no relationship to costs, or students may not pay any fees at all. A consequence is that as student numbers increase, the distance teaching institution faces an ever widening deficit. Where this situation co-exists with centralized control of finances, the deficit can only be met through increased government subvention, the curtailment of services to students, or improved cost-efficiency of

operations. Some alternative ways to produce texts that could prove more cost-effective are outlined below:

**BOUGHT-IN TEXTS.** A number of institutions buy course texts developed elsewhere and adapt them for local use. This approach allows the institution to select courses from the wide range available in other countries, and avoids the cost and time incurred in developing courses directly. For example, one private college we visited had acquired rights to an extensive range of such courses. The college used photocopies of a master set of texts for making specialist courses available to comparatively small groups of students. The arrangement was dependent on the availability of tutors with the necessary expertise to support the students.

**EXCHANGE OF COURSE MATERIAL.** A more immediate way to reduce the costs of writing and producing courses would be for institutions to exchange materials. The exchange of lists of available courses would be the first step in this direction.

**JOINT DEVELOPMENT OF COURSES.** The joint development of courses by distance education institutions is rare, although a number of projects are currently underway at the university level in Europe, and in southern Africa, Botswana, Lesotho, and Swaziland cooperated to produce six ordinary level courses. A review of the programs presented in the six countries reveals considerable common ground between institutions with regard to objectives, educational levels, and content of courses. Given this common ground, the joint production of course texts warrants consideration.

One obvious disadvantage is the high cost of transporting texts over long distances. The availability of inexpensive desktop publishing facilities could reduce these costs by allowing diskettes to be transported for reproduction at local centers. This would have the additional advantage of allowing text to be modified locally.

**MULTIPLE USES OF TEXTS.** An alternative approach that could be used for some programs is to reduce the number of texts produced by supplying copies to study centers for use by several students. However, in many distance education systems students are widely dispersed and come together only occasionally, if at all. In such cases the only option is to provide each student with the required course materials.

### *Text Delivery*

The dissemination of materials and the submission of assignments by students to tutors is for the most part by post. However, postal facilities are somewhat uneven. In some countries, mail to remote or rural areas can take a considerable time to arrive.

For the study center-based programs, delivery of materials in bulk to centers (as practiced in Malawi and Zambia) is a cost-effective mode of dissemination, especially in urban areas, but because most of the institutions in the six countries have free access to postal services, they have little incentive to reduce the costs involved in distributing course materials. Even so, distributing materials to the centers should serve to reduce the problem of individual students not receiving texts or receiving them late. The study center could also act as a collection point for submitting and returning assignments.

### *Radio*

Radio offers an effective and comparatively low-cost teaching medium, provided the problems of receiver and battery shortages can be resolved.

Radio requires a central broadcasting facility, which exists in each of the six countries. In some remote areas, however, reception is poor. In five of the six countries the radio transmission network is outside the education system, but is available for educational purposes. Ethiopia has a broadcasting system that is available for the exclusive use of education. There is no charge to the distance education organization for the use of the facilities, thus there is no incentive to ensure that each unit of broadcasting time is used to its maximum effect. The corollary is that the broadcasting service has no incentive to broadcast programs at times convenient to the students.

### *Face-to-Face Teaching*

The costs of programs using supervisors (who are not qualified second-level teachers) should be less than those of conventional education, even where attendance hours and student/supervisor ratios are the same as for conventional education, because of supervisors' lower remuneration. However, the salary differences are substantial, and any saving is reduced by the need to provide students with course texts. In most programs, however, the student/supervisor ratio is higher than the student/teacher ratio of conventional classes, which reduces costs somewhat. In Zambia, for example, the student/teacher ratio in secondary schools is about 25:1 while in the study groups the student/supervisor ratio is 58:1, and in Malawi the student/teacher ratio in secondary schools is 23:1 while the student/supervisor ratio is 55:1.

### *Sharing Resources*

Within individual countries, distance education institutions and other organizations cooperate to a fair degree. This cooperation is particularly well developed in relation to teacher education. However, even in programs for school leavers, many primary and secondary schools provide access to their facilities at times of low demand by their own students. Access to radio networks is another particularly valuable form of cooperation.

The sharing of resources among distance education institutions in different countries is much less developed. The main reasons are the significant differences in language and culture among the six countries, and the institutions' lack of resources needed to negotiate and carry through arrangements for cooperation with institutions in other countries.

Nevertheless, the savings from sharing resources should be significant. Each of the institutions we visited had invested considerable time and resources developing course materials. Where culturally neutral subjects are being taught at the same level and through a common language, the sharing of development costs and efforts would lead to substantial savings. Moreover, the economies of printing on a large scale would reduce costs further.

## Conclusions

This study found distance education systems operating at the second level and or providing teacher training in all six countries studied. Given the lack of understanding by policymakers of the methods used and the shortage of resources, the systems were operating reasonably successfully.

There is potential for much greater use of the systems to provide low-cost access to second-level education for primary school leavers and both in-service and pre-service education for teachers at lower cost than the traditional alternative. There is also potential for improving the quality of the distance education programs being provided. Increasing the status and autonomy of the distance education institutions, improving their administration and management, increasing the use of radio, and paying more attention to cost efficiency measures will all help to improve quality.

The achievement of two objectives would immediately help to increase the use and improve the quality of the education that the systems are providing. First, policymakers in these and in other countries should be informed about the systems, their potential benefits, and the important success factors. Second, practitioners should be brought together to examine how they can learn from similar operations in other countries and how they can cooperate to jointly develop course materials, set standards, and examine common training requirements.

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# 4

## IMPROVING EDUCATIONAL EQUITY FOR GIRLS THROUGH DISTANCE EDUCATION

*Molly Maguire Teas*

Education for all is a principal goal of education policy in most developing countries, but despite dramatic growth in the numbers of schools and students, access to schooling, particularly at the secondary and tertiary levels, is still limited.

The educational situation for girls is far worse than for boys. Fewer girls go to school than boys, and girls tend to drop out earlier than their male peers. Gaps between boys and girls in enrollment and participation widen at the secondary and tertiary levels.

Distance education is one way to improve educational equity for girls. As a low-cost alternative to the formal system of education, distance education programs around the world reach students who otherwise would not have the opportunity to attend traditional schools.

The purpose of this chapter is to discuss how distance education can improve access to education, particularly for girls, at the secondary and tertiary levels. The chapter focuses on Sub-Saharan Africa because of the interest recently expressed by African policymakers in using distance education, and because of Africa's great need for new strategies to improve educational equity. The premise is that distance education programs have the potential to improve greatly educational equity for girls in many countries; however, the existence of such programs does not ensure the full participation of eligible students, particularly girls. A strategic approach to program planning and policymaking is essential not only to ensure that girls have equal access to distance education programs, but also to improve the likelihood of successful program completion.

### **Background**

In many developing countries throughout the world, universal access to education became an issue when the countries gained independence from colonial rule. Systems of education designed to provide a European-style education to the young elite suddenly needed reassessment, restructuring, and expansion. Public schools were quickly built, administrative systems put into place, and teachers trained. As a result of these intensive efforts, enrollment numbers have increased dramatically.

Evidence from developing countries shows, however, that enrollment gains have been differential. While the enrollment situation for girls has improved over time, it has not improved at the same rate as for boys, and improvements have mainly been at

the primary education level. Tables 4.1 and 4.2 illustrate the problem with data from Sub-Saharan Africa. Between 1960 and 1983, the gap between the number of students eligible for school and the number actually enrolled narrowed considerably. However, the gap decreased mainly at the primary level and more for boys than girls. While more eligible girls are attending school at every level, most gains have been made at the primary level. Those students taking advantage of higher levels of education are primarily boys.

**Table 4.1** Gross Enrollment Ratios for Sub-Saharan Africa, Selected Years  
(number enrolled as a percentage of age group)

<i>Educational level</i>	<i>Males</i>				<i>Females</i>			
	1960	1970	1980	1983	1960	1970	1980	1983
Primary	48.0	59.0	87.0	80.0	24.0	36.0	64.0	63.0
Secondary	4.0	10.0	21.0	24.0	1.0	4.0	11.0	13.0
Tertiary	0.3	0.9	1.6	1.8	0.1	0.2	0.4	0.4

*Note:* Weighted means are used as summary measures

*Source:* World Bank (1988).

**Table 4.2** Female Enrollment Rates for Sub-Saharan Africa, Selected Years  
(females as a percentage of total enrollment)

<i>Educational level</i>	1960	1970	1983
Primary	34	39	44
Secondary	25	31	34
Tertiary	10	16	21

*Source:* World Bank (1988).

Tables 4.3 and 4.4 show the percentage of boys and girls enrolled by area of concentration at the secondary and tertiary levels. By far the majority of girls are enrolled in general and arts courses and only a few in teacher training, vocational/technical, or science programs. One consequence of such an enrollment pattern is that employment opportunities for female graduates may be greatly constrained.

**Table 4.3** Distribution of Secondary Enrollment by Type of Education, Sub-Saharan Africa, 1970 and 1983  
(percentage of all secondary students enrolled)

<i>Type of Education</i>	1970	1983
General	85	92
Teacher training	7	3
Vocational/technical	8	5

Source: World Bank (1988).

**Table 4.4** Distribution of Tertiary Enrollment by Field of Study and Sex, Sub-Saharan Africa, 1983

<i>Enrollment</i>	<i>Arts</i>	<i>Sciences</i>
Percentage of all students enrolled	59	40
Percentage of females enrolled	74	24

Source: World Bank (1988)

### Factors Influencing Female Educational Access and Perseverance

The economic and societal benefits of educating women have been well documented. "There is a sizeable literature that shows positive correlations between educational attainment and other desired outcomes such as increased earnings and productivity... Others show that educational attainment of women is positively related to reduced fertility, improved family health, and attributes of mothering" (Anderson 1988, p.3). Yet little rigorous research has been carried out to investigate the determinants of educational participation for women and how their needs can best be met through strategic educational planning and policy initiatives.

However, researchers have identified a number of key factors that influence whether or not females attend school. This chapter focuses on the factors that can be affected by educational policy. These factors, summarized in table 4.5, fall into two broad categories: those directly related to the household or school itself and those related to broader sociocultural issues. While not all the factors may apply to all

developing countries, they are important in many countries, and therefore merit serious attention by educational policymakers.

**Table 4.5 Factors Affecting Girls' Attendance at School**

<i>Household and school factors</i>	<i>Sociocultural factors</i>
Existence and proximity of school	Values and attitudes toward
Economic status of family	the role of women
School schedule	Job availability
Curriculum relevance	Equitable pay scales
Teacher gender	

#### *Household and School Factors*

As the table shows, five main household and school factors affect the attendance of girls at school.

**EXISTENCE AND PROXIMITY OF SCHOOL.** Evidence from studies in a group of Sub-Saharan countries, Egypt, and Nepal indicates that children are less likely to enroll and participate in schools that are far from their homes, and that distance is more likely to affect girls than boys (CERID/WEI 1984; Chaibderrain 1978; Robinson and others 1986). The findings reflect the situation in many developing countries, particularly in rural areas, where boys are allowed to travel farther from home than girls.

**ECONOMIC STATUS OF FAMILY.** Poverty is another critical determinant of school enrollment and retention. According to Anderson (1988, p. 9): "In all countries, children of poorer families are less apt to attend or complete school than children of families who are better off."

The hidden costs of schooling can make even seemingly low-cost schools inaccessible. Research carried out in Kenya indicates that in the low-cost schools, which are primarily boarding schools due to low population densities, children are required to provide their own beds, bedding, and eating utensils in addition to paying the annual boarding fee of approximately US\$20.00 (Nkinyangi 1982). When such extra costs are involved, the effect of poverty often has differential effects on boys and girls. Poor families may be more likely to invest in education for their sons rather than their daughters, particularly when they are not convinced of the benefit of educating girls.

In addition to school costs, many parents cannot afford the opportunity cost of sending their daughters to school. Traditionally, girls are responsible for the bulk of daily household work, including caring for siblings, fetching water and firewood, and preparing meals. Research from Egypt and Somalia, which reflects the situation in

many other countries, shows that most girls drop out of school because of the cost of education and/or the need for their labor at home (Robinson and others 1986).

**SCHOOL SCHEDULE.** Most schools operate during the daytime, a schedule that limits the opportunity to attend classes for students with household or outside work responsibilities. Supplementing or adjusting the school schedule to include split shifts or additional evening classes can have a great affect on attendance. In India, for example, Naik (1982) found that night classes held after girls complete their work and clean up after the evening meal resulted in much higher attendance than program planners had expected. Further, the level of interest in girls' education increased in the community.

For older women who want to complete secondary- or tertiary-level education programs, scheduling is a particularly important issue because women are often the *de facto* household heads. In such cases, the male partner may be temporarily absent due to work or migration or permanently absent due to separation or death. One study reports that women head 33 percent of the world's households, and that in urban areas, especially in Latin America and parts of Africa, the figure reaches 50 percent or more.

**CURRICULUM RELEVANCE.** Another factor limiting girl's school enrollment and attendance is that in many countries, society does not perceive formal education as relevant to girls' lives and responsibilities. Often, curricula do not build on children's life experiences, and instead are overloaded with facts and new vocabulary words. In addition, the texts themselves are often gender biased, reinforcing the sexual stereotyping of females as mothers and homemakers.

**TEACHER GENDER.** Several studies indicate a positive relationship between the number of female teachers in schools and girls' attendance (CERID/WEI 1984; Safilos-Rothschild 1979; UNICEF 1978). This correlation may be due in part to the effect of teachers acting as role models for female students. Female teachers may also be more likely than male teachers to involve girls in classes and understand their special needs.

### *Sociocultural Factors*

Household and school barriers to girls' full participation in educational systems are often compounded by restrictive values and cultural attitudes concerning the proper role of women in society. The barriers created by attitudes limiting women to sexually stereotyped work activities could be affected, however, if women were trained in employable fields and opportunities were created for employment upon school completion. Research from Chile, Malaysia, and Tunisia shows that when employment is available to women, they go to school (Kelly 1982).

## **Distance Education to Improve Educational Equity for Girls**

Distance education programs can address most of the factors that traditionally limit the full participation of girls in schools in a comprehensive and relatively rapid way. The most distinguishing feature of distance education is that it eliminates the need for an accessible school. Depending on the particular program, lessons are completed either individually in the student's home or in groups at the home of a student or facilitator.

For girls who must combine school and work, distance education can provide an affordable alternative to the traditional school system. Classes can be held or programs broadcast when the majority of participants are free from other responsibilities.

The curriculum of a distance education program, like any curriculum, can be written so that it is closely related to the specific skills and information the majority of learners need. In addition, distance program curricula can easily ensure that females provide important teaching, leadership, and professional role models to students in each lesson.

### **Planning for Women's Participation**

One cannot assume that a distance education program will automatically reach all its target audience, nor that the audience will complete the program once enrolled. As the factors affecting female participation in education are different than those affecting men, educators must carry out strategic planning for women's participation. An integrated planning approach is required not only to ensure that women have equal access to distance education programs, but also to improve the likelihood that they will complete them successfully.

Such an approach begins with the identification of women's educational interests and needs. These will likely be quite different from those of men in program scheduling, cost, and preferred method of instruction (the selection and mix of correspondence, radio, television, or face-to-face teaching). Once identified, planners must take women's practical needs into account during both the program design and implementation phases.

Distance education planners can also address the issue of equity by ensuring that distance education programs result in the same certificate, degree, or qualification that traditional programs give. Indeed, a distance education program for girls that does not result in degrees or certification comparable to those available in the formal system runs the danger of reinforcing and deepening the gender disparities that it seeks to dispel.

Another strategy to ensure women's full participation in distance education programs is to design special incentive policies. Program planners often overlook explicit incentives to participate in and complete programs of study. For example, formal recognition in the form of a degree or certificate of accomplishment is an important incentive. Without such formal recognition, a distance education program is unlikely to reach the students it targets.

Another option that can serve to encourage program completion is to link completion to increased salary. In-service teacher training programs, for example, can offer salary increases upon successful program completion.

A scheme to link program graduates with jobs would provide another incentive for program completion. For example, program graduates can be offered job counselling, internships, or preferential placement in selected jobs. Such approaches are essential if women are to break into jobs traditionally held by men, such as in science or technical fields.

Offering better promotion prospects or increased professional responsibilities to graduates of distance-based professional programs are further incentives for program completion. If program completers are offered better opportunities for upward movement

in their professions, they are likely to be more motivated to complete their program of study.

Disincentives can be more damaging to a distance education program than no incentives at all. Examples of disincentives to participation and completion of a program include the following:

- Charging a fee that most of the targeted students cannot afford;
- Designing a program that is unrelated to the students' actual needs;
- Requiring residential periods without providing affordable childcare;
- Requiring residential periods without providing safe, secure housing;
- Asking students to pay for materials;
- Asking students to pay for their own meals while attending a residential part of a course;
- Using unobtainable or unrelated support materials;
- Using an unfamiliar language or difficult wording in a familiar language.

Further research is needed to investigate more closely how different incentives work in particular settings and why. However, the experiences of distance education programs and available research show that unless students are provided with something tangible upon program completion, such as a certificate or increased pay, they are unlikely to be motivated to participate in and complete the entire course of study.

## Conclusion

While research and development should be critical components of any educational policy, enough information is currently available to guide governments in creating policies to enhance educational equity for females. This paper has focused on distance education as a policy option that can significantly expand and improve educational opportunities for girls. Such programs can address in a comprehensive manner the most important obstacles to women's participation in education: lack of access to schools, poverty, inflexible school schedules, irrelevant curricula, and lack of female teachers.

Distance education programs can be designed for any level of education or training and a variety of instructional modalities have already been tested in countries around the world. By identifying women's needs in the earliest stages of program planning, planners can make appropriate decisions on elements such as methods of instruction, scheduling, and appropriate incentive systems. Combined with quality programming, such an approach will help ensure that distance education programs are both accessible by and acceptable to girls.

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# Part II

## DISTANCE EDUCATION FOR SECOND-LEVEL COURSES

The next three chapters are concerned with the uses of distance education to provide second-level courses, particularly for primary school leavers.

The number of students completing primary school and failing to get into secondary school is increasing each year. For example, in Zambia in 1986, 135,000 pupils who completed primary education failed to get into secondary and it is estimated that the number will rise to 250,000 annually by the end of this century (Kelly 1986, p. 7)

This problem, combined with the difficulties governments face in allocating increased resources, means that governments must seek new ways to meet the demand for education. According to the World Bank:

To achieve a quantum increase in secondary enrollments without a commensurate increase in total costs or a serious decline in educational practices in Sub-Saharan Africa new means of education are required to reduce substantially the dependence of students on face-to-face contact with teachers (World Bank 1988, p. 7)

In chapter 5 Perraton identifies three approaches to using distance teaching techniques for second-level education: providing education outside schools to individual students working alone, providing educational materials to groups of students in study centers, and using distance teaching methods in conventional schools to raise the quality of education. A key question is are the methods used effective? Perraton examines the data available and looks at three themes that merit attention: equity, radio, and resource allocation.

While distance teaching does not require face-to-face support, educators recognize that young primary school leavers, in particular, need such support. In this context, the study center systems used for over fifteen years in Malawi, Zambia, and Zimbabwe are of interest to educators across Africa. In Malawi, these systems provide access to junior secondary education for more students than the secondary schools. Students study self-instructional materials daily in special buildings, helped full-time by people who are not trained secondary school teachers. However, the study centers are not thought to enjoy parity of esteem with secondary schools. Murphy (chapter 6) examines the effectiveness of the study center systems in the three countries under eleven headings: organization and management, quality of instructional materials and buildings, nature of face-to-face support, internal efficiency of central institution, student characteristics and perceptions, access to the system, throughput of students, acceptability of graduates, status, and social and economic benefit to the nation. This study provides valuable insights into the reasons for the poor status conferred upon the study centers.

Because the system uses people who are not trained secondary school teachers who deal with many more students than a secondary school teacher would, the system should be a less expensive way to provide second-level education than traditional

secondary schools. Other studies have confirmed that the system is cheaper, but is it more economical per successful learner? In his chapter on the system's costs in Malawi (chapter 7), Murphy uses information on examination pass rates and compares the cost per examination pass with the cost of day secondary schools. He also compares the costs of the two systems per student served and per subject passed. The results are of interest to educators and policymakers in Africa seeking to provide good-quality, low-cost, second-level education.

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# 5

## POST-PRIMARY DISTANCE TEACHING

*Hilary Perraton*

Secondary education faces the severest difficulties in Sub-Saharan Africa. Demand for it has increased following the earlier expansion of primary education. It is relatively expensive, with unit costs between four and five times those of primary education (World Bank 1988, p. 34). The region's economic problems have resulted in fewer resources available to secondary education and, in consequence, its quality has suffered. It is criticized both because "qualifications-earning is ritualistic, tedious, suffused with anxiety and boredom, destructive of curiosity and imagination; in short anti-educational" (Dore 1980, p. 69), and because it has been socially regressive: "Does schooling widen the gap between rich and poor? Given the objective that some people have for schooling to promote social mobility and to redistribute income, the answer, surprisingly, is 'yes' for most developing countries" (Simmons 1980, p. 4).

### Three Models of Distance Education

The purpose of this paper is to examine how far distance education can address secondary education's problems of quantity and quality: how far it can widen access to secondary education and raise its quality. In doing so, distinguishing between three different approaches to distance education is useful. The first is to provide education outside school often using correspondence courses for individual students working at home. The second is to use similar materials for groups of students in study centers, offering something like a school but at reduced cost. Third, some countries have used distance teaching methods within conventional schools to raise their quality.

The first model—individual students working at home—has a long history, but an inglorious one. It was the mainstay of the British and South African correspondence colleges, which dominated distance education in Africa until ministries of education and universities moved into the field. It has remained part of their work, but the sad evidence is that few independent students working at home and without support from a study center succeed in studying at a distance. Curran and Murphy (1989, p. 11) found that in two of the countries they surveyed "fewer than 5% of enrolled students had sat for the examinations after five years of study and up to three-quarters of the students had stopped studying completely." Successful distance study demands that students are highly motivated, have already learned how to learn, have access to libraries, and can get support from family or friends familiar with the educational problems they are tackling. For many learners working alone in many parts of the continent these conditions do not apply.

The difficulties of the isolated student led to the development of the second model, study centers. Both Malawi and Zambia developed study centers with much more modest resources than those of a conventional secondary school in which the burden of instruction was carried by correspondence courses with some radio support. Study center supervisors help students as they use their courses (see Wolff and Futagami 1982). Other study center systems have been developed outside Africa. In some parts of Latin America, for example, radio has been used more extensively to support centers of this kind than has generally been the case in Africa (see Perraton 1983).

In the third model—within schools—distance teaching methods have been used to raise the quality of secondary schools and to change their curricula. In some cases, broadcasting has been used on a grand scale in the context of an educational reform program. The classic example was in Côte d'Ivoire, but television was also used in American Samoa and El Salvador in similar ways. The high costs of television—sometimes ten times the cost of radio—coupled with the practical difficulty of running a rural television service in a country with a low population density and limited mains electricity proved disastrous.

Disillusionment with the initial promise of educational media has been most acute in the case of television. Compared to other media, expectations were higher, the flagship projects received more attention, up front investments in capital were much higher, goals were more comprehensive and collapses were that much more painfully felt. As a result... World Bank lending for television projects has fallen off dramatically and... worldwide use of television in distance learning institutions is decreasing (Nettleton n.d., p.15).

However, other approaches to the use of distance teaching methods to support schools are available. In Mauritius, correspondence courses with broadcast support have been used to introduce new subjects to the school curriculum (Dodds 1982). Many other countries have used interactive radio, mainly at the primary level, in which students are required to make frequent active responses to direct radio teaching in a technique that might be adapted to the secondary level (see Radio Learning Project n.d.).

The three models share one common feature: all rely on careful and thorough preparation of teaching materials at a central institution. "One of the particular strengths of the IRI (Interactive Radio Instruction) programs... was that the materials and systems were based on solid principles of instructional design, geared towards holding student attention and interest" (Nielsen 1990, p. 12). The development of high-quality teaching materials is a necessary condition for the success of distance education programs, though not a sufficient one.

## Effectiveness

Data on the effectiveness of all three models are limited. Examining the effectiveness of out-of-school education is always difficult as cohorts of students studying in school and out are rarely comparable. Nevertheless, the limited data on independent distance study are so discouraging that the model would seem to be of limited value for ministries of education or for the people they are serving.

In the case of Malawi, the best documented example of a program of study centers, those using them had performed less well on the primary leaving examination than those who went to secondary school. With a cost per student lower than that for regular

students, and cost per successful student comparing favorably with boarding schools but unfavorably with day schools (Wolff and Futagami 1982): "Overall pass rates for MCC students on the National Junior Certificate examination have been between 10 and 22 percent over the past few years. These pass rates are low compared with those of regular secondary schools, but they are satisfactory in the light of the MCC's much lower admissions standards" (World Bank 1988, p.59).

Data suggest that distance teaching methods can be effective in raising the quality of education in schools. A comparison across five countries of the use of interactive radio concluded that:

IRI program classes were consistently and significantly higher [in academic achievement] than the conventional classes in all countries. Besides that, research shows that both students and teachers are positive about the system and that it engages them fully. Because students achieve better under the system and are more engaged in their studies, drop-out and repeater rates have been expected to fall. So far, however, there has been no firm evidence that this has happened. There is, however, evidence from one country, Thailand, that relative achievement is even more positive in rural areas than in urban ones... In another comparison, when IRI was examined in relation to other interventions, its impact on achievement was shown to be greater than for either the introduction of textbooks or teacher training (Nielsen 1990, pp 8-9).

In Mauritius, the use of correspondence materials and broadcasts in schools appeared to raise the quality of teaching while broadening the curriculum and achieving improved examination pass rates (Dodds 1982, p. 123).

Costs for the third model have usually been additional to the costs of regular education (in the first two models costs have been for an alternative to regular school). In some cases this means that institutionalizing the programs has been impossible: add-on recurrent costs for interactive radio have typically been between US\$0.25 and US\$1.00 per student per year (Nielsen 1990, p. 9), costs that are relatively high against a 1983 average annual cost per primary school student—the level at which most interactive radio projects have been addressed—of US\$48 (World Bank 1988, p. 34).

## Themes

This rapid summary of experience suggests a number of themes, namely, equity, radio, and resource allocation, that deserve further attention.

### *Equity*

The evidence is consistent in suggesting that students can learn at a distance, with fewer resources than are needed for a regular school, provided that they have some support from an institution such as a study center. However, as one would expect, they perform less well in their examinations than those at school. A reasonable assumption is that the process of their education is also inferior. Cheaper education is usually, though not always, worse. In a meritocratic society we may be quite happy that the ablest children get the most expensive and best education. Where resources are severely limited, the most cost-effective way to develop secondary education for human resource development may also be to follow meritocratic principles. But if we do not accept this argument, then the numbers clamoring for secondary education and the opportunities to

provide some kind of alternative system of secondary schooling through distance education present a dilemma. Do we seek a two-tier system, tacitly accepting that children will be inequitably allocated to the different tiers, or do we face the political difficulties of integrating the two tiers in some way?

Picking up the idea of a village college with responsibility for all forms of in-school and out-of-school education I argued for a triple approach to escape from the dilemma.

The first part of the approach would be to improve the quality of education at school, using distance teaching to extend the curriculum, to introduce new subjects, and to change styles of teaching... The second part of the approach would be to improve the quality of distance teaching outside school. ... In order to achieve [this] it might be necessary to get the regular schools to accept an increased responsibility for students outside their walls. The effect of these two approaches would be to reduce, although not to eliminate, the difference between work in school and work out of school... The third part of the approach takes us back to the community. If the community became more involved in the running of a school, it would then seem more reasonable that the school should serve students both inside its walls and out. And if the school, in its turn, could look to the community for more support, and that community support could be offered also to children outside school, then the gap between children at school and outside would, again become a little narrower (Perraton 1983, p. 74).

Thus, we need to consider the relationships between in-school and out-of-school education as these bear on the future development of distance education, taking into account the competing demands of equity and efficiency. In addition, we need to ask how far is distance education likely to redress or worsen existing imbalances in education for boys and girls?

### *Radio*

School broadcasting has a long history. Despite the collapse of the grand television schemes, and despite the practical difficulties of maintaining radio sets and distributing batteries, broadcasting remains a powerful educational tool. The interactive radio projects have demonstrated a new and apparently effective way of using radio that might be adapted to work at the secondary level. At the same time, school broadcasting services, like distance teaching institutions, have remained at the edge of the concerns of ministries of education. We should examine how far radio could be brought in from the cold as part of the program to raise quality in schools as well as outside.

### *Resource Allocation*

Historically, distance teaching institutions have built up their budgets by estimating the costs of writing and distributing courses, employing tutors, broadcasting to students, and so on. More recently, it has been possible to work back from the results and express these in terms of a cost per student or cost per successful student. We are almost at the point where we can ask the economist's question about the most effective allocation of resources to conventional and unconventional forms of education in order to produce graduates at the minimum cost. The question is absurdly narrow, and omits questions about the quality of the educational process, about equity, and about conflicts

between education and credentialling. However, to pose it enables us to ask more realistic questions about the level of resources that it makes sense to allocate to distance education and about ways to define that level.

## Conclusion

Distance education has proven itself a valuable tool to address the crises facing secondary education systems in Sub-Saharan Africa. In particular, when high-quality teaching materials are thoughtfully developed and used, distance teaching programs can succeed in introducing new subjects and increasing students' achievement in school. If questions of equity and cost-effectiveness were explored further, problems of access and quality could be greatly diminished.

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# 6

## EFFECTIVENESS OF FULL-TIME SECOND-LEVEL DISTANCE EDUCATION IN THREE AFRICAN COUNTRIES

*Paud Murphy*

Most educators believe that distance education costs less than conventional alternatives, and in times of severe resource constraints African countries will need to consider how to make greater use of distance education at all levels of education. While providing primary education using only distance education presents particular problems, there are advantages at the higher levels of education, and the World Bank has recommended that in seeking to substantially reduce unit costs at the second level, the governments of Sub-Saharan Africa "identify and implement new instructional methods that rely much more heavily than in the past on the input of students' time and motivation and that economize on expensive capital inputs and teachers' time" (World Bank 1988, p. 61).

The World Bank identifies radio programs and correspondence materials in self-study schools and extramural programs as the key to reduced costs. This chapter focuses on the effectiveness of the self-study schools, also known as study centers, that have been established in three countries in Africa.

### **Study Centers**

African nations have been using distance teaching methods to provide a second-level education for many years, some since independence. Initially, the aim was to provide a second-chance education to the many adults who did not have the opportunity to attend secondary school in the colonial era. However, only a very small number of students completed the courses, and even fewer students passed the external examinations. Those that succeeded were mainly teachers or other professionals for whom a certificate meant a higher salary. Eventually the distance teaching units began to provide education to other target groups, including young primary school leavers who were not able to get a place in secondary school.

Three countries in southern Africa, Malawi, Zambia, and Zimbabwe, recognized the problems recent primary school leavers faced in coping with modes of study that demand a high level of motivation and discipline, and established support systems for the students. Table 6.1 sets out the characteristics of the study centers in the three countries.

**Table 6.1** Characteristics of Study Centers in Malawi, Zambia, and Zimbabwe

<i>Characteristic</i>	<i>Study center country</i>		
	<i>Malawi</i>	<i>Zambia</i>	<i>Zimbabwe</i>
Target audience	Recent primary school leavers unable to get a place in secondary school		
Enrollment in distance education institution	Enrollment first, then assigned to study center	Sign up with study center first, then enroll with distance education institution	
Access to printed self-instructional correspondence courses and a marking service	Yes	Yes	Yes
Radio broadcasts available	Yes	Yes	No
Type of buildings used	Special	School	Special
Frequency of student meetings	Daily	Daily	Daily
Full-time, paid helper available (not a teacher)	Yes	Yes	Yes
Level of helper's education/training	Primary school teacher	Primary school teacher	Secondary completer, no teacher training
Special training arranged for helper	Occasionally	Rarely	No
Number of study centers (1986)	93	203	635
Total number of students (1986)	14,000	13,082	40,858

Source: Curran and Murphy (1990).

These systems provide an interesting alternative to the secondary school systems in each of the three countries, and studies have shown that the cost per student is a fraction of the cost in secondary schools (Murphy, chapter 7 in this book; Perraton 1983; Wolff and Futugami 1982). An examination of the effectiveness of the education they provide will help determine their ability to provide good quality, low-cost, second-level education for the increasing numbers of primary school completers in Africa.

## Effectiveness

Like beauty, educational effectiveness lies in the eye of the beholder. Governments, parents, employees, local communities, and students have different views of the desired benefits of education: governments emphasize its economic and social benefits, parents are concerned about how it cares for children and prepares them for life, employers want usable skills, local communities want their values maintained, and students want the stimuli it provides and the certification for employment. How effectively the system of education works to produce the desired benefits will determine their view of

its effectiveness. As a report by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) states:

Effect analysis is complicated, in formal and non-formal education, by the multiple aims of educators. There are many legitimately held views on the purposes of education, both among educators and the public at large.

When examining the effectiveness of distance education systems, the same relationship between objectives and effectiveness holds and the same preliminary question must be asked. What are the systems' aims? Aims differ from one system of education to another, thus the effectiveness measures used must be different. For example, many distance education systems aim to help groups such as working adults or people with a handicap of some kind. The effectiveness of these systems must be judged by their ability to help those groups and any comparisons made should be with systems with similar aims. However, distance education systems that aim to provide an education equivalent to, and to the same type of student as, conventional schools and colleges can legitimately be compared with them.

Three authors, McAnany, Rumble, and Smith have guided my choice of factors that determine effectiveness. However, a number of general points need to be made before listing the factors.

The first concerns the difference between measures that determine the external effectiveness of an educational organization and those that determine its internal efficiency. Measures of external effectiveness do not require a detailed knowledge of the internal workings of an educational institution. However, an examination of its internal efficiency may help explain some of its external effects.

The second point is that when examining effectiveness, one must bear in mind the institution's aims. Many distance education institutions aim to help students who cannot be reached by traditional institutions, for example, working adults or people in remote areas. Comparing the pass rates these institutions achieve in public examinations with those from traditional institutions would be incorrect.

Finally, one must bear in mind the students' motivation and backgrounds. Students in some distance education programs study only parts of courses, often for personal satisfaction, and do not always sit for the examination. Also a particular distance education institution may be taking in students who have not performed well in examinations or who are disadvantaged in some way. These factors must be accounted for when comparing output with other institutions.

### **The Effectiveness of Study Centers**

With these points in mind, we can identify eleven factors that might help evaluate the effectiveness of study center systems:

1. Organization and management,
2. Quality of instructional materials and buildings,
3. nature of face-to-face support,
4. Internal efficiency of central institution,
5. Student characteristics and perceptions,

6. Access to the system,
7. Throughput of students,
8. Pass rates,
9. Acceptability of graduates,
10. Status,
11. Social and economic benefit to the country.

Factors 1-4 are concerned with the system's internal efficiency, factor five with the students, and the remaining factors with external effectiveness.

### *Organization and Management*

Malawi's study center system was initiated in 1965 and is run by the Malawi College of Distance Education (MCDE). The MCDE decides whether a study center will be established, recruits and pays supervisors, produces and distributes instructional materials, arranges marking, and monitors all aspects of the work. The MCDE is a unit of the Ministry of Education and Culture, and the principal of the MCDE reports to the principal secretary for education.

The MCDE has no autonomy with regard to finances and staffing. Each year it is assigned a budget, but the salaries of MCDE staff are paid directly by the Ministry of Education and Culture, and the ministry also pays most of MCDE's bills. The MCDE does not determine fee levels or staff numbers, and cannot employ staff directly. Instead the ministry, in consultation with the Department of Personnel Management and Training, determines staff numbers and levels. If a staff member leaves the MCDE, the ministry determines whether the staff member should be replaced and advertises and recruits for the position. In 1986, the MCDE had 109 designated staff positions, of which 87 were filled.

A World Bank (1987) report on the MCDE pointed out that clear policy decisions and priorities are lacking, that goals and targets for each division are not set, that the work of different sections is not coordinated and the work load is unbalanced, that the MCDE does not have the financial expertise to plan its budget accurately or to analyze costs by type of activity, and that its senior staff are frequently changed.

Zambia's study center system was established in 1974, and the National Correspondence College (NCC), is responsible for supplying instructional materials, arranging marking, and training supervisors for the study centers. However, NCC is part of the Department of Continuing Education, which is within the Ministry of General Education, and it is officers of this department who recruit and monitor study center supervisors but do not report to the NCC. As in Malawi, neither the NCC nor the Department of Continuing Education have autonomy over finances and staffing: they do not set fees, pay bills, or determine staffing numbers and levels. In 1987, NCC had nineteen academic and seventy-six administrative positions, of which fourteen academic positions and seventy-one administrative positions were filled. The NCC's main problems are a lack of coordination, a surplus of subject staff and a shortage of supervisory staff, and a shortage of transport to visit study centers.

Zimbabwe's study center system dates back to the early 1960s, and is the responsibility of the Department of Non-Formal Education (DNFE) within the Ministry

of General Education. The department recruits and monitors the work of supervisors in the study centers. Zimbabwe differs from Zambia and Malawi in not having a national distance education college. Commercial colleges produce the instructional materials and mark the students' work. The department monitors standards in these commercial colleges. Details on the functioning of the DNFE are not available.

Thus, in each country the study center systems have been in operation for more than a decade and are organized by the ministry of education. In Malawi and Zambia, the institutions responsible for organizing the study center systems have limited autonomy, activities are not coordinated, the internal organizational structures are unsatisfactory, and staff shortages are apparent.

### *Quality of Instructional Materials and Buildings*

Print is the principal medium of instruction for study center students in Malawi. At the junior certificate level, courses are available in English, history, geography, mathematics, biology, Chichewa, religion, commercial studies, and accounts. At the Malawi certificate of education level, courses are available in all but the last two subjects, which are replaced by commerce. All the courses are designed to be self-instructional and are intended for all MCDE students (home, night secondary, and study center).

Some courses are at least ten years old. Some, such as mathematics and English, are much better presented than others, such as history. Surprisingly, examination results are not correlated with the best laid-out courses. In the junior certificate examination in 1985, external candidates performed best in Chichewa with 85.0 percent passing, and worst in biology, with only 10.1 percent passing, yet study center supervisors and MCDE staff considered biology to be the best written course.

Print is also the principal medium of instruction in Zambia and Zimbabwe. In Zambia, courses for study center students have been written in mathematics, English, history, geography, civics, health science, and bookkeeping at the junior certificate level, and in English, human biology, geography, commerce, history, economics, and principles of accounts at the general certificate of education level. Each course has twenty to thirty lessons and a test to be sent in for marking at the end of each lesson. All courses are designed to be independent of textbooks. Illustrations are used little. The courses vary in quality.

Radio programs are designed to back up the courses in Malawi and Zambia. In Malawi at the junior certificate level, programs have been designed in Chichewa, history, biology, geography, English, and mathematics, and at Malawi certificate of education level in English, history, and geography. The programs last for fifteen minutes and are broadcast during school hours. Each program is repeated once. The quality of the programs is variable. Most are one-voice presentations and do not encourage student interaction. Study center supervisors and teachers in charge claim that some programs are on topics no longer taught, and that the program sequence is not the same as the correspondence course sequence for some subjects. With the exception of history, all the programs are at least fourteen years old.

In Zambia the NCC, in collaboration with the Educational Broadcasting Service, has produced radio programs in four subjects for junior secondary students and in two

subjects for general certificate of education students. Many of these programs were produced over ten years ago. According to staff in the Educational Broadcasting Service, NCC staff do not send new scripts and do not suggest changes (personal communication). The magazine-style programs that NCC designs have three sections: a general section that may cover topics such as good study habits, a section answering specific student queries, and a section that provides information on the availability of lessons and textbooks and on examination and study timetables. The two programs heard in the course of this study had voice variation and responded well to students' questions.

No information about radio programs is available for Zimbabwe.

Malawi's study center buildings are of variable quality. Those that were built by the Government of Malawi using a World Bank loan are well designed and built. Others range from mud buildings with no windows, to community centers that are used as classrooms by day and dormitories by night, to primary school classrooms.

In Zambia, 188 of the 205 study center buildings are located in primary schools in standard classrooms. This is because the responsibility for starting a study center lies with primary school principals.

In Zimbabwe, centers have been located in a diverse range of physical locations. However, many centers are now located in primary and second-level schools (Curran and Murphy 1990, p. 177).

### *Face-to-Face Support*

A major feature of the study center systems is the use of full-time staff to support the students: supervisors in Malawi and Zambia and mentors in Zimbabwe. In Malawi, 253 of the 257 people employed in study centers in 1986 were trained primary school teachers who had completed the Malawi certificate of education and two years of teacher training (MCDE records). They are expected to perform administrative tasks and to support and encourage the students as they work through the correspondence courses. They are also expected to arrange for students to listen to the radio programs and to encourage them to submit scripts for marking. They are not expected to teach as they do not have the subject expertise. The overall ratio of students to supervisors was 55:1 in 1986.

In Zambia in 1986, 209 of the 237 full-time supervisors were trained primary school teachers (NCC records). The handbook that NCC issues to supervisors lists the following as their duties: keeping attendance records, coaching the students while following NCC's daily timetable, keeping mark records, keeping a flow chart of lessons, keeping NCC staff informed of any difficulties, ensuring that students use the national library service, spending time on extracurricular activities, attending a monthly staff meeting, displaying model answers, filling in transfer forms for students, being willing to upgrade their qualifications, and ensuring that a radio timetable is displayed (NCC, n.d., pp. 12-13). Teaching is not listed, and lest supervisors confuse coaching with teaching, the handbook explains that coaching activities "do not involve teaching in the general sense of the word, but rather helping the student to develop good study habits" (p. 24).

In Zimbabwe in 1986, 1,022 mentors were working in study centers. These are expected to have passed five ordinary level (O-level) examinations, however, many do

not have these qualifications. Mentors are not teachers, their role is to supervise students at study, to assist them with techniques of correspondence study and to maintain discipline" (Curran and Murphy 1990, p. 177).

Thus, in each country supervisors are not expected to teach. However, interviews with twenty supervisors in Malawi and twenty-six in Zambia indicated that they do teach some of the time. Curran reports from Zimbabwe that: "In practice some instruction is given by mentors especially in English and vernacular languages" (Curran and Murphy 1990, p. 177).

The reason that supervisors and mentors end up teaching is first, in Zambia and Malawi the students do not have all the printed lessons and cannot always listen to the radio programs, and the supervisors feel obliged to teach to help them cover the course. Second, in all three countries supervisors have come through the conventional education system. Simply helping students to study is a novel way of doing things. Despite this, supervisors are still not trained in teaching methods, apparently because of a shortage of resources. No information is available on training of mentors in Zimbabwe. Third, students have come through the primary school system and expect the study centers to continue the pattern. Fourth, students lack the ability to study on their own. In primary schools, many received instruction in large classes, from unqualified teachers using rote methods. As a consequence, they are poorly prepared for a system where they are expected to study on their own.

#### *Internal Efficiency of the Central Institution*

Even the best instructional materials are no good to the student who does not receive them. The MCDE has not been producing sufficient quantities of the printed courses for students studying in any of its systems. A survey conducted in 1983/84 of 15,000 junior certificate students found that they were short 66,000 of the necessary 525,000 booklets. The MCDE has itself estimated that it printed 500,000 fewer booklets than its students needed between 1981 and 1986. To make matters worse, study center supervisors claim that the booklets do not arrive in the correct order.

The NCC also has serious problems producing sufficient quantities of printed courses for its students. It does not have the equipment to produce all the courses needed, and has contracted out for printing since 1980. However, commercial printers' prices have been rising and delays have occurred in delivering printed courses. The NCC annual report for 1984 (1985, p.13) report states that: "The lesson crisis which centers experienced in 1983 continued in 1984. Most of the centers received only half of the lessons which were supposed to be studied in 1984."

No difficulties are reported from Zimbabwe where, as already noted, commercial colleges supply the courses.

The radio programs present another problem. The Malawi Broadcasting Corporation broadcasts programs when most students are in study centers. The MCDE has supplied radios, and in some instances tape recorders, to all study centers and the supervisors are expected to arrange for the students to listen to the programs as they are broadcast. However, discussions with supervisors at twenty centers indicate that very few centers have a working radio or tape recorder because the batteries used are not easily available in rural areas. Thus, few students can benefit from the radio programs.

In Zambia, programs are broadcast throughout the day, but most study centers meet only between 2:00 and 5:00 p.m. None of the eight study centers the author visited had a working radio. At a course for twenty-six supervisors in the Lusaka district, twenty-four said they had no radio and the other two said they had no batteries.

Information about the use of radios in Zimbabwe is unavailable.

When study center students complete assignments, the assignments are normally sent for marking to the organization responsible for producing the study materials. For students to receive the maximum benefit, assignments need to be returned quickly, with helpful comments on students' performance. In Malawi, the MCDE has not been very efficient in arranging for students scripts to be marked and returned speedily. According to a number of study center supervisors, students have had to wait up to three months for marked scripts to be returned.

Zambia also encounters problems arranging for scripts to be marked, and the number being marked has declined from 500,000 in 1982 to 100,000 in 1986 (NCC records). NCC staff report that this is because the marking fee is too low. In 1986, the NCC started an experiment in three provinces whereby supervisors marked scripts in four subjects. No report on this experiment is available.

No information is available on the efficiency of Zimbabwe's marking service.

### *Student Characteristics and Perceptions*

In Malawi, the breakdown of study center students by age and sex is very similar to the composition of secondary school students. For example, only 15 percent of all new enrollments to MCDE in 1983 were older than twenty compared to 10 percent of new entrants to secondary schools, and 70 percent of MCDE new entrants were boys compared to 68 percent in secondary schools (Government of Malawi 1984, p. 46; MCDE records). In contrast to most systems of distance education, study center students do not work during the day, as this is when they must attend study centers.

The students studying in study centers in Zambia are all recent primary school leavers, and half are female. In secondary schools the percentage of females was 36.6 percent in 1985 (Kelly 1991). Thus in Zambia, study centers are providing access to secondary education for girls. Students in study centers are likely to be of similar age to secondary school students (NCC records).

In Zimbabwe a small proportion of study center students, about one in six, are mature students. The remainder are of conventional school going age (Curran and Murphy 1990, p. 174).

Students in study centers in Malawi are expected to study for about five hours each school day and in Zambia for three hours a day. In Malawi many stay in hostels close to the centers. In both countries students are expected to participate in extracurricular activities (NCC 1980, p. 13; personal communication).

The major reward that students in Malawi expect is a place in a secondary school, but as will be explained, this is becoming more difficult to achieve. A second reward is the expectation of a job. Given the scarcity of junior certificate and Malawi certificate of education graduates in Malawi, this is not an unrealistic expectation. Studies have shown that students with any secondary education are likely to earn relatively good



salaries. "In general the rate of return evidence shows that education is an extremely attractive personal investment, particularly for post-primary students" (Tan, Lee, and Mingat 1984, p. 49).

In Zambia, students' chances of obtaining a secondary school place or a job are even lower than in Malawi. Nevertheless, the study center system offers the only hope for attaining these goals, and may attract students as a result.

Informal interviews with four students in each of eighteen study centers in Malawi revealed that all would prefer a secondary school if given the choice. Almost all were happy with the arrangements and the teaching in the centers. Very few had all the printed materials, and none had listened to the radio programs. However, given the limited evidence, we cannot draw firm conclusions about students' perceptions of Malawi's study center system.

### *Access to the System*

As table 6.2 shows, the number of students enrolling in the study center system in Malawi increased rapidly during the 1980s. The absolute numbers enrolling to study for the junior certificate examination have increased particularly rapidly.

**Table 6.2** New Enrollments in Study Centers in Malawi, 1981-87

<i>Year</i>	<i>Junior certificate</i>	<i>Malawi certificate of education</i>
1981/82	3,836	174
1982/83	3,990	87
1983/84	4,962	25
1984/85	6,147	51
1985/86	6,569	599
1986/87	6,455	918
1987/88	6,960	1,592

*Source:* MCDE enrollment records.

Note also that the number of new students enrolling to study for the junior certificate examination in the study center system has been greater than the total number enrolling in all government-supported secondary schools since 1984. In 1986/87, 6,455 new students enrolled for the junior certificate in the study center system, compared with 5,940 in government and government-aided secondary schools. The result of this is that the study center system increases the percentage of those students passing the primary school leaving examination (PSLE) and getting access to government-supported secondary education from 10 percent to over 20 percent (a further 1.5 percent gained access to private secondary schools). Note that despite this, approximately 80

percent of the students who pass the PSLE are still not gaining access to a second-level education.

In Zambia, the numbers enrolling in the study center system rose less dramatically (table 6.3).

**Table 6.3 Study Center Enrollments in Zambia, 1981-87**

<i>Year</i>	<i>Junior secondary</i>	<i>General certificate of education</i>
1981	11,294	359
1982	n.a.	n.a.
1983	11,023	547
1984	11,220	510
1985	9,916	357
1986	12,795	287
1987	13,174	248

n.a. = not available

Source: NCC records.

The relative impact of the study center system on access to secondary education in Zambia is smaller than in Malawi for two reasons. First, access to secondary schools is easier in Zambia than Malawi, with transition rates between the final year of primary school and the first year of secondary school varying from 20 to 30 percent in Zambia, compared to less than 10 percent in Malawi. Second, while the overall numbers studying for the junior certificate examination in Zambia's study center system are similar to those in Malawi, Zambian study center students take three years to complete the course while those in Malawi only take two years (in each country students in secondary schools take two years).

In Zimbabwe, the numbers of students studying in the study center system grew particularly rapidly in the early 1980s, but then leveled off (table 6.4).

While the absolute numbers enrolled in study centers in Zimbabwe are very high, as a proportion of the numbers enrolled in secondary schools they are smaller than in either Zambia or Malawi, and equivalent to some 8.5 percent of second-level students in the formal system in 1985 (Curran and Murphy 1990 p. 175). This is likely to be because the numbers getting into secondary schools have been rising each year.

Study centers in Malawi are more physically accessible than government secondary schools. In 1986 Malawi had ninety-five study centers compared with fifty-seven

secondary schools. Despite the convenient locations throughout the country, more than half the study centers have boarding facilities provided by the community.

**Table 6.4** Number of Students in Study Center Programs in Zimbabwe, Selected Years

<i>Year</i>	<i>Enrollment</i>
1980	9,423
1982	37,726
1984	41,139
1986	40,858

*Source:* Curran and Murphy (1990).

In Zambia in 1986, the 205 study centers were located in all but four of Zambia's fifty-two districts.

Many of Zimbabwe's 635 study centers in 1986 were located in primary and secondary schools, which the study group uses outside normal school hours (Curran and Murphy 1990, p. 177). No further data are available on location.

In terms of academic requirements, in all three countries study centers are more accessible than secondary schools. Entrance to the study center systems in Malawi and Zambia is based on a simple pass in the Primary School Leaving Examination. This contrasts with the entrance requirements for government-supported secondary schools to which students are admitted on the basis of the best performance in the examination. Only the top 10 percent were admitted in Malawi in 1986 and the top 23 percent in Zambia in 1984 (personal communication, chief planner, Ministry of General Education 1988).

### *Throughput of Students*

The MCDE study center system appears able to retain students until the examination. Table 6.5 shows numbers enrolled in year one and in year two the following year.

Numbers studying in year two are invariably larger than those in year one the previous year. MCDE staff and study center supervisors explain that students are allowed to repeat under extenuating circumstances such as illness or family problems. While this may explain the differences in numbers, it makes getting an accurate figure for drop-outs difficult. The author's examination of the attendance registers in five study centers showed that very few students dropped out after the first three months, and all those who dropped out in the first three months had been offered places in secondary schools.

**Table 6.5** Numbers in Forty-Nine Malawi Correspondence College Study Centers, 1981-85

<i>Calendar year</i>	<i>Form one enrollment</i>	<i>Form two enrollment in following year</i>
1981	2,454	2,455
1982	2,484	3,163
1983	3,130	3,401
1984	3,324	3,692
1985	2,909	3,593

Source: MCDE enrollment records.

In Zambia, the drop-out rate from year one to year two was 25 percent between 1982 and 1983, 16 percent between 1983 and 1984, and 22 percent between 1984 and 1985. Between 1985 and 1986 and 1986 and 1987, the numbers in year two were greater than the previous year one. This is explained by NCC staff as the result of a policy to admit junior secondary examination repeaters in those years. The transition rate between years two and three is confused by the numbers of repeaters and because some students take the examination after two years instead of the recommended three.

No information is available on drop-out rates in Zimbabwe.

Thus, despite the problems students face, most who enroll in Malawi and Zambia go on to take the examination.

### *Pass Rates*

Most external candidates, that is, students studying outside secondary schools, who sat for the junior certificate examination in Malawi studied with the MCDE (Malawi National Examinations Board records). The board has records of the numbers of MCDE students sitting and passing the junior certificate examination since 1980. However, these results do not tell us how well study center students performed. In 1985, for the first time, students were asked what mode of study they followed and the results were analyzed by mode. Of the 6,049 MCDE study center students who sat for the examination, 888 passed six subjects, including English, at one sitting (table 6.6).

Table 6.7 provides the results of Malawian study center candidates during 1985-89. As the table shows, the percentage passing at one sitting is increasing each year, with a very significant improvement between 1987 and 1988. Discussions with senior MCDE staff and with study center supervisors suggest that this improvement occurred partly because the MCDE's overall service has improved. Note that the results for secondary school candidates also improved from a pass rate of 80 percent in 1987 to 93 percent in 1988.

Given that some MCDE students do not take six or more subjects at one sitting and are not recorded as passing the junior certificate, the number of full passes in the junior

certificate may not be the best measure of MCDE's effectiveness. Another measure is the number of subjects taken and number of subjects passed.

**Table 6.6 Junior Certificate Examination Results in Malawi by Mode of Study, 1985**

<i>Mode of study</i>	<i>Number entered</i>	<i>Number passed</i>	<i>Percentage passing</i>
Study center	6,049	888	14.68
Night secondary school	863	59	6.84
At home	3,250	23	0.71
At school	6,518 <sup>a</sup>	4,889 <sup>a</sup>	75.01
Own study	50	3	6.00

a. These figures include 553 entries and 299 passes from private secondary schools.

Source: Unpublished data, Malawi National Examinations Board.

In 1985, external candidates sitting for subjects offered by the MCDE took 51,300 subject examinations and passed 21,568 (42 percent) of them. Internal candidates taking the same subjects took 43,536 subjects and passed 33,379 (77 percent). While figures are not available by mode of study, in the light of the information given in table 6.7, one can postulate that study center students would achieve subject pass rates higher than 42 percent.

It is interesting to compare the results in different study centers. One could hypothesize that there would be little difference in results between study centers, given that the study materials are the same and that the supervisor's role is not to teach, but to support the learning. MCDE study centers and head office have been keeping records of entries and passes for each study center since 1981. These data showed that pass rates ranged from 25 to 73 percent (with a weighted average of 38 percent) for the ten centers with the best performance during 1985-87, and from 5 to 10 percent (with a weighted average of 8.5 percent) for the ten centers with the worst results during the same period.

Clearly the choice of center is a determining factor in how well students perform. Discussions with MCDE staff identified only one agreed reason for the success of some study centers and the failure of others: the quality of the supervisors, particularly the teacher in charge.

In Zambia in 1984, thirty study centers submitted their results to the Examinations Council of Zambia. Of the 1,270 students who had sat the full examination, 214 (21.6 percent) had gained a certificate. This compares with the overall pass rate of 14.8 percent for external candidates in that year and 63.5 percent for schools candidates. In 1986, forty-four study centers submitted their results. Of the 2,081 students who sat for

the full examination, 31 percent passed. Due to the lack of data for external candidates and school candidates for 1986, no comparisons are possible.

**Table 6.7** Numbers of MCDE Study Center Students Entering and Passing the Junior Certificate Examination, 1985-88

<i>Year</i>	<i>Number entered</i>	<i>Number passed</i>	<i>Percentage passing</i>
1985	6,049	888	15
1986	8,160	1,347	17
1987	8,388	1,988	24
1988	7,147	3,931	55
1989	7,346	2,937	40
Totals	37,090	11,081	30

*Source:* Unpublished data, Malawi National Examinations Board.

Official statistics on examination results in Zimbabwe are not available.

#### *Acceptability of Graduates*

Up to 1984, all study center students who passed the junior certificate examination in Malawi were guaranteed a place in form three of secondary schools. In 1983, 862 MCDE students were admitted to form three. This policy was then changed to admit only the best junior certificate performers from secondary schools and study centers. In 1985, only 192 were admitted, but this number rose to 387 in 1986 and rose again to 521 in 1987. The policy is now to be changed again and no secondary school student who passes the junior certificate examination will be excluded from form three. Any spare places will then be given to MCDE study center students on the basis of the results in the junior certificate examination. As the percentage of secondary school students passing the examination is rising, this will mean fewer places for study center students.

One of the reasons the policy has changed is because school principals complained that MCDE study center students could not perform well in the compulsory laboratory science subject for the Malawi certificate of education since they had not taken a laboratory science subject in the junior certificate. There is some evidence that former study center students do not perform as well in the Malawi certificate of education examination as their colleagues who have studied in secondary school for the full four years. The author surveyed examination results in three schools. In physical science (one of the laboratory science subjects) and mathematics, past MCDE study center students performed much worse than students who had studied for four years in secondary schools, in biology and English they performed slightly worse, and in general science (also a laboratory science subject) they appeared to perform about the same.

It is not unreasonable to expect that former MCDE study center students would not perform as well as their secondary school colleagues, given that their performance on the primary school leaving examination would certainly have been worse than the PSLE performance of their school-based colleagues, and they would probably have achieved lower grades than average in the junior certificate examination.

While no recent figures are available on the number of NCC study center students gaining a place in senior secondary school in Zambia, far fewer places are available in senior secondary school than the number of school students who pass the junior certificate examination. Approximately 50 percent of those who pass can proceed to senior secondary school (Government of Zambia 1986, p. 50). Thus, senior secondary school places are probably held for school students who have performed well in the examination.

Discussions in Malawi with officials of the Department of Personnel Management and Training, the government agency responsible for recruitment into the public service, indicate that there are no barriers to getting posts within the public service for junior certificate or Malawi certificate of education holders who have studied with the MCDE. The qualification is the only requirement. The demand for junior certificate holders is still such in Malawi that jobs are available; however, this is no longer the case in Zambia. As Kelly reports: "Even high levels of education are no longer an assured entry to any form of employment, let alone that in the formal sector" (1991, p. 220). While there are no reported barriers to NCC graduates getting posts in the formal sector, the economy is unlikely to provide many jobs in the formal sector in the immediate future.

No information is available on the acceptability of graduates from the study center system in Zimbabwe.

### *Status*

Getting a precise measure of the status of the study center systems in the three countries is extremely difficult. On the one hand in Malawi, the system has been in operation for twenty years and continues to grow. On the other hand, none of the parents the author met in Malawi in the course of this study would send their children to a study center if they could get into a secondary school. While the quality of the instructional materials varies from course to course in Malawi, some secondary school teachers use the same courses, and probably more secondary school students listen to the radio programs than do study center students. The Malawi College of Distance Education is held in relatively high regard by educators, and increased resources are being devoted to it each year. The government recognizes the importance of the study center system in its latest ten-year plan for education and envisages enrollment increases of up to 44,000 by the end of the plan period.

For the national broadcasting service to devote more than fourteen hours of air time weekly to MCDE programs is also an indication of status. Finally, the importance of study centers in Malawi is demonstrated by the Malawi National Examinations Board's provision of a detailed breakdown of MCDE results by mode of study and by study center. To the author's knowledge, no other country in English speaking Sub-Saharan Africa does this.

In Zambia, the study center system has been in operation since 1974. A very subjective judgment would be that the National Correspondence College enjoys a relatively lower status in Zambia than does the MCDE in Malawi. Again, informal discussions with parents suggest that they would choose secondary schools rather than study centers for their children. The government has no plans to expand the system and is encouraging the establishment of basic schools. The Examinations Council of Zambia does not analyze the results of NCC students. The NCC is part of the Department of Continuing Education, which itself is considered a low status entity. As Kelly points out: "The general picture that emerges of the programs that are offered by the Department of Continuing Education is that they are marginal to the main stream of educational provision in the country and that they enjoy a low priority in resource allocation" (Kelly 1991, p. 251).

It is not possible to draw any conclusions about the status of study centers in Zimbabwe. Factors that may have a bearing are the location of the administration within the Department of Non-Formal Education, the use of commercial colleges to provide the printed materials, the fact that radio appears not to be used at all, and the government's intention to provide four years of secondary school education for all.

### *Social and Economic Benefit to Country*

The benefits of a well-educated population have been clearly documented (for example, World Bank 1988, pp. 21-26). In Malawi the shortage of educational provision at the post-primary levels means that the people needed to fill government and private sector posts are in short supply. A World Bank report (1987, pp. 2, 3, 106) concludes that it is socially and economically productive for Malawi to invest in education, and shows that the rate of return to investments in education is highest at the second level. The MCDE study center system is contributing to the country's economic development by helping more students to pass the junior certificate and Malawi certificate of education examinations.

In Zambia, by contrast, the demand for those with some secondary education is declining. The Lusaka urban labor force survey of 1987 found that 30 percent of the unemployed in Lusaka had a secondary education (reported in Kelly, 1991, p. 220). Despite this, and despite Kelly's plea for a change in the curriculum to adapt to real needs in Zambia, it may be that young people with secondary education will be better able to find worthwhile employment in the informal sector.

On the face of it, the provision of more access to second-level education is socially desirable. Many children who would not get a second-level education are provided with the opportunity to study in the study center systems, and a growing number of them are passing the examinations. However, the equity of providing two systems of education with the resources devoted to each student in one system being significantly less than those devoted to each student in the second system must be questioned. On the one hand, we can argue that providing a study center system enables many students to get a second-level education who could not otherwise get one. On the other hand, the study center system may simply provide a safety valve to mitigate the complaints of parents whose children do not get into secondary school.



## Conclusions

This study of the effectiveness of study center systems in Malawi, Zambia, and Zimbabwe permits the following observations:

- The study center systems provide access to a second-level education for many students who would not otherwise get one.
- The study center systems are helping to satisfy a social demand for education.
- The available data indicate that study center students perform better in examinations than other out-of-school candidates in Zambia and Zimbabwe. More comprehensive data are available in Malawi, and they show that study center students perform better than other out-of-school students, but worse than secondary school students.
- The drop-out rate from study center systems appears to be low in all three countries.
- Students in Malawi are generally satisfied with the education provided in study centers.

These generally positive achievements have occurred despite the following factors:

- The organization and management of the study center systems in Zambia and Malawi is adversely affected by the lack of autonomy of the central institutions and by a number of internal problems.
- The internal efficiency of the two institutions managing the study center systems in Malawi and Zambia is not satisfactory as students are not getting all the printed materials, they are not able to listen to the audio materials, and the marking service is not being provided to all students.
- The quality of the instructional materials is variable in Zambia and Malawi. No instructional materials are designed specifically for students in the study center systems. The buildings used for study centers are also of variable quality.
- Face-to-face support is not working as intended in Malawi, Zambia, or Zimbabwe.
- Students who complete junior secondary education in the study center system may be discriminated against in access to higher levels of second-level education in Malawi. There is no evidence of discrimination against study center system graduates in access to jobs in either Zambia or Malawi.
- Study center systems appear to hold lower status than regular secondary schools in all three countries. The system in Malawi enjoys a relatively high status among government officials and is a major feature in plans for the expansion of second-level education.

The continued existence of the study center systems in the three countries provides some evidence that they are perceived as performing a useful function. Unfortunately, however, the quality of education provided is not high. The pass rate in secondary examinations is almost certainly lower than in secondary schools, and the study center systems do not provide access to laboratories or workshops, and students have a limited choice of subjects. They appear, therefore, to be a second-rate parallel system to the secondary schools.

Despite the problems of the study center systems, some individual study centers produce very good results. The best ten centers in Malawi, for example, had examination pass rates averaging 38 percent during 1985 -87. This represented about half the pass rate from secondary schools, but was twice the average achieved by all study centers. One center in Zimbabwe appeared to be achieving better pass rates than the secondary schools. Overall results of students in the study center system in Malawi have been improving faster than results in the regular secondary schools. The drop-out rate is low.

Thus, the study center systems appear to be a viable and acceptable way to provide second-level education. They are in demand, they retain students, and they can achieve good examination success rates. To realize their full potential, however, their quality must be improved. This cannot be done by the organizations running the study center systems on their own. They need government support and encouragement. The following six suggestions for improving quality can only work in this context.

1. Governments should give some attention to the organization and management of the central organizations running the study centers. These organizations must be provided with sufficient staff; should be given autonomy in financing, in staff recruitment, and in determining priorities; and a major training program should be arranged for all staff.
2. A number of the courses should be revised and specifically directed at study center students. Courses that take account of the environment in which study center students are studying are likely to be more effective than courses aimed at students studying alone.
3. Sufficient quantities of the printed courses must be produced in Malawi and Zambia so that every student in the system has access to all the courses. The printed courses are the major teaching source for the study center students, and without them they cannot be expected to perform well in examinations.
4. Each study center must have radios or tape recorders and a power source. Currently few students can listen to the radio programs and the resources invested in producing and broadcasting the programs are largely wasted.
5. The teachers in charge and the supervisors in the study center systems should be trained in the roles expected of them. Almost all expect to provide traditional classroom instruction; however, none is trained at the second level.
6. In the longer term, students in the study center systems should have access to laboratories and libraries. While building laboratories in each study center may not be possible, experience in other countries has shown that laboratory kits work. It may also be possible to arrange for some individual centers to share laboratories with the nearest secondary school. The Malawi National Library Service has begun to visit individual study centers, and this, combined with increased book supplies from the MCDE, should provide a good substitute for a library. Similar arrangements may be possible in Zambia and Zimbabwe.

These measures would, of course, increase the costs of study centers, though with the possible exception of the last two suggestions, the cost increases are unlikely to be great. However, the evidence of improving pass rates in Malawi, despite the problems with radio, print, and face-to-face support, suggest that an increased investment per student could yield a disproportionately greater return to student success rates.

## Options for Policymakers

The modest successes achieved by the study centers in Zambia, Zimbabwe, and Malawi indicate some possibilities for policymakers to consider. Some tentative and general suggestions follow. A detailed analysis of needs in particular countries would yield other more country-specific suggestions.

1. *Increase overall access to second-level education for recent primary school leavers.* Study centers offer a less costly alternative to secondary schools in a supportive environment that is suitable for primary school leavers. Communities may be able to provide the buildings needed, the study materials can be provided by the correspondence college (and paid for by the students), and the government can provide the teachers. The disadvantage of this option is that those students applying for the study centers are likely to be students who cannot get into secondary school. Over time, if all the weaker students go to the study centers the results will be worse than the results from secondary schools, and the perceptions of the study centers as a second-rate system will be strengthened.
2. *Provide access to a second-level education for recent primary school leavers in remote areas.* It is often difficult to justify building a day secondary school in a remote rural area given the small numbers of primary school leavers. Providing six subject specialists for 100 students may not make economic sense and moving the 100 students to boarding schools may not make economic sense either. In the study center system the subject specialist is the correspondence course or the radio program, and the number of teachers can be directly related to the number of students. The disadvantage with this option is similar to that with option 1. However, because the students are likely to be selected on the basis of location rather than examination success, their results may not be significantly worse than the results of traditional secondary school students. Special attention must be paid to the quality of the education provided so that rural students are not perceived to be getting a second-rate education.
3. *Provide the last two years of compulsory education for all children through study centers.* A number of countries have increased the number of years of basic education to eight or nine. The last two or three of these years is normally expected to be in a traditional secondary school. This is an expensive undertaking. Providing these years in study centers would be much less expensive and would solve teacher shortage problems. The problem of people perceiving the study centers as a second-rate system would not be so great if all students were studying in the system. This would also ensure that the resources and attention needed to improve the quality of the education being provided in study centers would be available.

The options policymakers choose will differ from country to country depending on their educational needs, resources, and government support. The study center system clearly has the potential to provide access to second-level education to more students and in more places than traditional secondary schools can achieve.

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# 7

## COSTS OF FULL-TIME SECOND-LEVEL EDUCATION USING DISTANCE TEACHING METHODS IN MALAWI

*Paud Murphy*

Educators recognize that young people need a supportive learning environment and regular contact with teachers to maintain motivation. Most distance teaching systems depend on the students' own motivation and ability to study alone and are suited to the adult or the independent learner. Young primary school leavers are unlikely to be sufficiently motivated and disciplined to study regularly and consistently without support. Accordingly, they need systems that, like secondary schools, provide daily meetings in groups and have adults to encourage them, to provide goals, and to monitor their progress.

In recognition of this need, three countries in southern Africa—Malawi, Zambia, and Zimbabwe—have systems that combine distance teaching techniques with a supportive environment. In each country the systems are intended to help recent primary school leavers who are not able to get a place in secondary school. The systems' operations were described in chapter 6.

These study centers should cost less than regular secondary schools for at least two reasons. First, a system that replaces secondary teachers with primary school teachers is likely to cost less. In the early 1980s, teachers' salaries took up 64 percent of all government recurrent expenditure in secondary education across nineteen countries in eastern and southern Africa, and 86 percent of costs in Malawi. In those same countries, the salaries of secondary school teachers were on average 2.3 times those of primary school teachers, and in Malawi, three times (Wolff 1984, pp. 42, 45).

Second, the student/teacher ratio is a critical determinant of average costs. Student/teacher ratios in secondary schools in the early 1980s averaged 22:1 across eastern and southern Africa, and 21:1 in Malawi (Wolff 1984, p. 41). The student/teacher ratio in the study centers is in excess of 50:1.

The two published studies available on these systems agree with these points. For Zambia, Perraton (1983) estimates the costs of providing education to each study center student as somewhere between K50 and K150 per year, and compares these costs with the costs of conventional secondary education. He concludes that "the cost per student at a supervised study center is between about a quarter and a twentieth of the cost at a regular secondary school" (p. 11). Wolff and Futugami (1982) attempt to analyze the costs of the Malawi College of Distance Education (MCDE). However, unlike Perraton, they do not distinguish between the costs of supporting students in study centers and the

costs of other students being supported by the MCDE. They conclude that for each MCDE student:

Costs per student are much lower than the costs of conventional secondary schooling, especially when taking into account the depreciation of buildings... the total annual costs per student are K216 for day secondary schools and K580 for boarding schools, as compared with K133 for the MCDE centers (p. 96).

While the evidence on cost per student enrolled seems conclusive, the studies' usefulness was hampered by a lack of data on effectiveness, particularly on examination success rates. For Zambia, according to Perraton:

We lack adequate data on the examination success and failure rates of the National Correspondence College. An many such students enter individually for the examination, it is extremely difficult to assess its examination pass rates (1983, p. 11).

For Malawi, Wolff and Futagami (1982, p. 98) were only able to guess the number of MCDE students who passed the junior certificate examination in 1977. Perraton concludes that:

It is more difficult to say how the costs per successful student compare but the figures are such that the College could well teach students, and get them through the examination, at a lower cost than that of regular secondary schools (1983, pp. 12-13).

However, the evidence for this view is not available from these studies. It could be that very few study center students actually pass the examinations, and that while the cost per student is lower than the cost per student in secondary schools, the cost per successful student may actually be higher.

Since 1985, the Malawi National Examinations Board has been providing details of examination passes for its study center system. Accordingly, one can now examine the costs of running a study center system in Malawi and relate this to the costs of (a) access, (b) full examination passes, and (c) subject passes. This chapter attempts to do that. It also analyzes the costs of the day secondary school system in Malawi and relates this to the same three measures. Note that a comparison of distance education systems and schools may not be valid in many cases where distance education systems take in adult learners who have been away from school for many years, and whose objectives may not include an examination pass. However, comparing the output of study center systems with secondary schools is reasonable. The students are of similar ages and backgrounds, both groups study full-time, and both work to pass the examination. Note also that secondary school students are admitted on the basis of best performance in the primary leaving examination, while study center students are generally chosen from those whose examination performance was not sufficient to gain entrance to secondary schools.

## **Education in Malawi**

Malawi is a republic in southeastern Africa that gained independence from the United Kingdom in 1964. It is one of the ten poorest countries in the world: in 1984 its GNP per capita was estimated at US\$180. The average annual rate of growth of GNP per capita between 1965 and 1984 has been estimated at 1.7 percent. The country's population is projected to increase annually by an average 3.4 percent, from 6.8 million in 1984 to 12 million in the year 2000 (World Bank 1984, p. 82; 1986, p. 180).

The proportion of the total government budget devoted to education, 9.6 percent in 1985, is low by standards in the region and is projected to grow to 12.8 percent by 1996. The average for all low economies is 14.6 percent (World Bank 1988a, p. 138).

Malawi's formal system of education offers eight years of primary education, four years of secondary education, and from two (teacher training) to five years of tertiary education. Schooling is not compulsory. The Ministry of Education and Culture is responsible for all education and training.

Table 7.1 provides an overview of the primary school system in 1987/88, and illustrates many of the problems of primary education at that time, namely: more than one-sixth of the enrollment were repeaters, 15 percent of the teachers had no teaching qualifications, and classrooms and inspectors were in short supply.

**Table 7.1 Primary Schools in Malawi, 1987/88**

<i>Enrollment</i>	<i>Of which repeaters</i>	<i>Teachers</i>	<i>Of which qualified</i>	<i>Number of schools</i>	<i>Number of inspectors</i>
1,066,642	225,547	16,885	14,433	2,660	55

*Source:* Adapted from Government of Malawi (1988).

Numbers in the final year of primary school are also very high because many children repeat the year to improve their results in the primary school leaving examination (PSLE) and their chances of entry to secondary school. Many students get into secondary school after repeating the final year of primary school, most more than once. Willis (n.d.) showed that more than 70 percent of pupils in the second year of secondary school in 1983/84 had repeated the PSLE more than once, and only 4 percent had been admitted into secondary school without repeating.

In 1987/88, Malawi had seventy-nine secondary schools. The pupil/teacher ratio was a low 21:1, and half of the teachers were graduates (table 7.2).

**Table 7.2 Secondary Schools in Malawi, 1987/88**

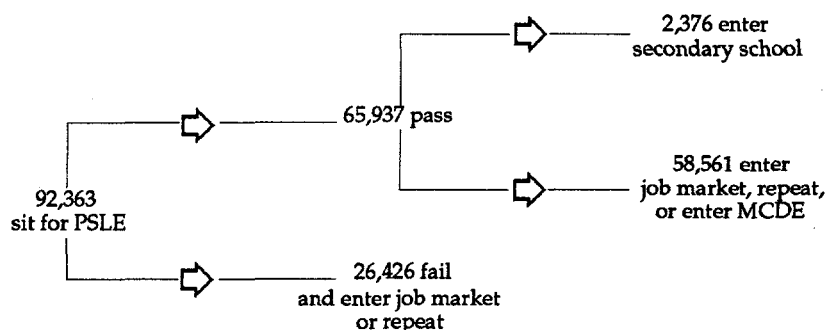
<i>Enrollment</i>	<i>Number of teachers</i>	<i>Of which Graduates</i>	<i>Pupil/teacher ratio</i>	<i>Number of schools</i>	
				<i>Government</i>	<i>Private</i>
26,396	1,258	656	21:1	61	18

*Source:* Adapted from Government of Malawi (1988).

Government expenditure per pupil in secondary school in 1984/85 was MK371 compared to MK30.9 at the primary level (MK1=US\$0.375 in March 1989). The major

problem with the secondary school system is not one of quality, but of access: too few places are available. In 1987/88 government schools provided access for 6,114 students and private schools provided access for a further 1,262 students. Each year an increasing number of students complete primary education and most pass the primary school leaving examination. In 1987, 92,363 students sat for the examination, compared to 41,534 in 1975. At least 70 percent of those sitting for the examination in each year have passed, and in 1987, 65,937 students passed. Only 7,376 of these (11 percent) were admitted to form one of secondary school (about 1,200 of these in private schools). Figure 7.1 shows the situation in 1987.

**Figure 7.1** Flow Path of Primary School Leavers in Malawi, 1987



Secondary schools can accommodate some 5 percent of the age range and 11 percent of the PSLE passers. There is a very large unsatisfied demand for second-level education as a result. It is this unsatisfied demand that the Malawi College of Distance Education was established to meet.

### Malawi College of Distance Education

The Ministry of Education and Culture established the Malawi Correspondence College in 1965 to cater for the needs of two groups: adults who wanted to continue their education, and primary school leavers unable to get a place in secondary school. That same year the ministry also established a schools broadcasting unit to organize school broadcasts at the primary, secondary, and teacher training levels. In 1973 the college and the broadcasting unit combined to become the Malawi Correspondence College and Broadcasting Unit. The college was renamed the Malawi College of Distance Education in 1988. The MCDE is a department of the ministry operating out of premises in Blantyre, Malawi's commercial capital, with 109 full-time staff positions (17 at the graduate level), of which 87 were filled in 1986. In addition, the MCDE is responsible for the work of 257 "teachers" working full-time in 95 study centers throughout Malawi, 110 part-time teachers in 17 night secondary schools, 117 part-time teachers marking student assignments, and 22 teachers writing instructional materials (1986 figures).

The MCDE offers courses leading to the following examinations: the primary school leaving examination, the junior certificate (JC) examination, normally taken after two years in secondary school, and the Malawi certificate of education (MCE), normally



taken after a further two years of study in secondary school. The MCDE also offers a teacher upgrading course.

In 1985/86, 10,470 new students enrolled with the MCDE. The number of new enrollments has trebled since 1975 and doubled since 1979. Of the new enrollments, 82 percent were planning to take the junior certificate and 16 percent were planning to take the MCE (table 7.3). As the table shows, the numbers taking the teacher upgrading course and the primary school leaving examination course are very small, while the numbers enrolling for the JC courses are increasing each year. Since 1981/82, the numbers enrolling with the MCDE for the JC courses have been greater than the numbers enrolling in form one of secondary schools.

**Table 7.3 Annual New Enrollments, by Examination Course, in the Malawi College of Distance Education, Selected Years**

Year	PSLE	JC	MCE	Teachers upgrading	Totals
1974/75	130	2,916	560	206	3,812
1978/79	173	3,627	1,018	78	4,896
1981/82	279	6,564	1,371	90	8,304
1982/83	257	6,689	1,220	50	8,216
1983/84	191	7,387	1,082	44	8,704
1984/85	161	8,496	1,558	63	10,278
1985/86	243	8,547	1,641	39	10,470

Source: MCDE enrollment records.

### *Teaching Methods*

MCDE aims to use the three-way teaching system, combining good quality, printed, self-instructional materials with radio programs and face-to-face support. It has prepared and printed self-instructional correspondence courses for nine subjects at the JC level, eight subjects at the MCE level, and six subjects at the PSLE level. It has also prepared and printed courses for teachers and prepared radio programs for JC students, MCE students, teachers, and the general public. Each week the Malawi Broadcasting Corporation devotes over fourteen hours to broadcasting MCDE programs.

MCDE organizes face-to-face support in two ways. First, it recruits and pays primary school teachers to work full-time helping MCDE students in study centers. Second, it recruits teachers to help students in night secondary schools. In 1986, 110 teachers were working in 17 night secondary schools, of which 59 were qualified secondary school teachers, 16 were university graduates, 41 were diploma holders, and 51 were primary school teachers.

### *Study Systems*

The MCDE uses three systems of study. Under the first system, students study at home. They enroll with the MCDE, pay the fee, and receive the correspondence courses

and a timetable of the radio programs. They study the courses on their own, listen to the radio programs if they can, and send their work to the MCDE for marking as they finish each book. The marker is expected to write helpful comments on each assignment. Home study students receive no face-to-face support. In 1986, about 2,000 new students began to study at home and an estimated 1,200 students continue to study in this way.

The second system is the night secondary school system. Students enroll with the MCDE, pay their fee, receive the correspondence course, and then register in a night secondary school. Here they receive assistance from teachers for two hours each weekday evening. They are encouraged to send their work in to be marked, helped with difficulties, and, where a working tape recorder is available, listen to tapes of the radio programs. They also receive traditional classroom instruction in a number of subjects. Night secondary schools are established at the request of the principal of a day secondary school (or occasionally of some other person) and when student numbers justify it. A teacher is designated as head of the night secondary school and is responsible for keeping records and communicating with MCDE. Night secondary schools were originally established to cater to working adults, but the majority of those attending in recent years have been unemployed. In 1986, 1,074 new students enrolled in night secondary schools and a further 881 students continued their studies.

The third and the most widely used of the three systems is the study center system. The operation of the study centers has been described in some detail in chapter 6. As table 6.2 showed, during the 1980s the number of students enrolling in study centers increased rapidly, especially students studying for the junior certificate examination.

### *Pass Rates*

As explained in chapter 6, the Malawi National Examinations Board has been recording the results of distance education students' performance in the JC examination since 1985. Night secondary school and home study students obtain significantly poorer results than study center students, while students in regular secondary schools achieve significantly better results, with at least 70 percent passing the examination each year.

To attain a full pass in the junior certificate, candidates must pass six subjects including English at one sitting. This measure ignores students who achieve passes in a number of subjects, but fail to pass six or fail English. A measure of success that includes the achievements of these students is the subject pass rate. This relates the number of subjects taken by students to the number of subjects passed. In 1985, MCDE students took 43,536 subjects and passed 33,379 (77 percent).

### **Costs of Study Centers in Malawi**

All the costs of running Malawi's study center system fall into three categories: central support costs, direct study center running costs, and student-related costs. The central support costs include all the costs the MCDE incurs in designing, producing, and distributing its correspondence courses; in designing and producing the radio programs; and in supervising the study centers. Central costs also include part of the annualized cost of MCDE's buildings and equipment, the Ministry of Education and Culture's cost to supervise the study center system, and the Malawi Broadcasting Corporation's costs to transmit its education programs. For the central costs, separating which relate

specifically to the study center system as opposed to the night secondary school or home study systems is difficult.

Direct costs incurred in running the study centers are easier to assign than central costs. They include the salaries of teachers-in-charge and supervisors, the annualized costs of buildings and equipment, maintenance and running costs associated with the study centers, and the annualized costs of radio receivers and textbooks in the study centers.

Student-related costs includes food, accommodation, and transport for students and the costs of any earnings they forego while studying.

Table 7.4 brings together all the costs involved in running the study center system in 1984/85. Appendix 1 provides more details on how these costs were calculated.

**Table 7.4 Breakdown of Costs of the MCDE Study Center System, 1984/85**

<i>Cost category</i>	<i>Amount (Malawi kwacha)</i>	<i>Remarks (interest rates are 7.5%)</i>
<i>Central costs</i>		
MCDE running costs	428,000	Total building cost. See analysis in appendix 1
MCDE building costs	69,915	Over 50 years
MCDE equipment costs	36,925	1/2 depreciates over 20 years, 1/2 depreciates over 10 years
MBC transmission costs	136,592	See appendix 1
MoEC supervision costs	60,000	—
<i>Direct study center costs</i>		
Supervisors and teachers-in-charge	260,300	—
Study center running costs	84,000	MK2 per student per term for lights and batteries
Study center buildings	858,900	Depreciate over 50 years
Equipment and books	27,800	22,500 radios and tapes, and 90,000 books; both depreciate over 5 years
<i>Student-related costs</i>		
Food and transport	1,344,000	MK32 per student per term, MK96 per student per year
Hostels	455,560	Depreciates over 50 years
Foregone earnings	None	See appendix 1

*Source:* Author's calculations from unpublished data from MCDE records, the Ministry of Education, and the Ministry of Information and Broadcasting.

In 1984/85, the total cost of the study center system was MK3,761,992. With 13,996 students in the system, this represents a cost of MK268.79 per student, or MK269 when rounded off. Of this per student cost, the government contributed MK134, the student (or

family) contributed MK102, and the community contributed MK33. The interesting contributor here is the community, which provides the buildings for student hostels. The community also provides a cook, but students' fees cover the cost of the cook. The government's contribution can be broken down into capital and recurrent costs or fixed and variable costs. These will be discussed next.

### *Capital and Recurrent Costs*

Table 7.5 breaks down the government's contribution to the costs of the study center system into capital and recurrent costs. The annualized capital cost is MK993,540 (53 percent), while the recurrent costs are MK884,892 (47 percent).

**Table 7.5** The Government's Contribution to the MCDE Study Center System by Capital and Recurrent Costs, 1984/85

<i>Cost category</i>	<i>Annualized amount (Malawi kwacha)</i>	<i>Remarks</i>
<i>Capital costs</i>		
MCDE building	69,915	Total building cost: MK1,174,000. Apply 77.6% to study centers and annualize over 50 years
MCDE equipment	36,925	Total estimate MK391,000. Apply 77.6% and discount half over 10 years and half over 20 years
Study center buildings	858,900	—
Study center equipment and books	27,800	MK90,000 for books, MK22,500 for radios and tapes, over 5 years
<i>Recurrent costs</i>		
MCDE running costs	428,000	77% of total running costs of MK553,000
Ministry of Education and Culture's supervision costs	60,000	Includes allowance for overheads
Malawi Broadcasting Corporation transmission costs	136,592	This includes amortization of buildings
Study center supervisors and teachers-in-charge	260,300	—
<b>Total</b>	<b>1,878,432</b>	

Sources: Curran and Murphy (1990).

The main capital item is the cost of the study center buildings, which makes up 86 percent of the capital cost. The main recurrent cost is the MCDE's running costs (48

percent). The recurrent costs are MK63.22 per student and the capital costs are MK70.99 per student.

### *Fixed and Variable Costs*

Table 7.6 allocates all the government's costs of running the study center system to fixed and variable costs.

**Table 7.6 MCDE Study Center System Costs by Fixed and Variable Costs, 1984/85**

<i>Category</i>	<i>Amount (Malawi kwacha)</i>
<i>Fixed costs</i>	
MCDE buildings	69,915
MCDE equipment	36,925
Some MCDE running costs (see appendix 1)	184,000
Ministry of Education and Culture	
supervision costs	60,000
MBC transmission costs	136,592
Total fixed	<u>487,432</u>
<i>Variable Costs</i>	
Some MCDE running costs (see appendix 1)	244,000
Study center supervisors and teachers-in-charge	260,300
Study center buildings	858,900
Study center equipment	27,800
Total variable	<u>1,391,000</u>
<b>Total fixed and variable</b>	<b><u>1,878,432</u></b>

*Source:* Same as table 7.4.

As table 7.6 shows, the study center buildings have been treated as a variable cost. One could argue that for small increases in student numbers the annualized cost of study center buildings could be treated as a fixed cost, since the existing buildings could accommodate the extra numbers. However, with few exceptions, the existing buildings are already overcrowded and any significant increase in overall numbers will require more study center buildings.

The main items in the fixed costs are MCDE's running costs (38 percent of the total) and the Malawi Broadcast Corporation's transmission costs (28 percent). The main

variable cost is the annualization of study center buildings at 62 percent of the total or MK61.37 per student per year.

### *Analysis of the Cost Function*

We can now calculate the relationship between fixed and variable costs using the formula:

$$TC(N) = F + V \cdot N$$

where TC = total cost, N = number of students, F = fixed cost, and V = variable cost per student. For study centers N = 13,996 and V = 99.39 (1,391,000/13,996), thus:

$$TC(N) = 487,432 + 99.39 (N)$$

as the average cost to the government per student is MK134.21, the variable cost is 74 percent ( $99.39/134.21 \times 100$ ) of the average cost, making it unlikely that significant economies of scale can be achieved. For example, if student numbers rose to 20,000 and fixed costs remained the same, the average cost per student would only fall to MK124.76. If student numbers rose above 20,000, fixed costs are unlikely to remain the same.

### *Costs in 1987/88*

In 1987/88 the government allocated MK1,717,258 to the MCDE. With 24,417 students signed up with the MCDE, this worked out to a cost of MK70.33 per student. These costs compare with an allocation in 1984/85 of MK824,850 for 18,982 students, or MK43.45 per student. Although the government's allocation to the MCDE apparently increased between 1984/85 and 1987/88, Malawi's inflation rate averaged 24 percent per year in the intervening years, thus at 1985 prices, the MK70.33 the government spent on each MCDE student in 1987/88 was only worth MK37.02.

These costs refer to the direct government support for all the MCDE's work. To ascertain government support for the study center system, they must be disaggregated from other MCDE costs (table 7.7). By 1987/88, 69 percent of the MCDE's enrollment consisted of study center students. Appendix 1 shows that 72 percent of the MCDE allocation was devoted to these students. These figures compare to 74 percent of the enrollment and 77 percent of the costs being associated with study centers in 1984/85.

Direct government allocation to the MCDE is only one of the forms of support the government provides to MCDE. Other support includes the capital costs of equipment and buildings, some of the running costs of the Malawi Broadcasting Corporation, and the costs the Ministry of Education and Culture incurs in supervising MCDE's work. These costs are taken into account in table 7.8.

**Table 7.7** Direct Government Contribution to the MCDE Study Center System's Running Costs, 1987/88  
(current Malawi kwacha)

<i>Cost category</i>	<i>Amount</i>
Government contribution to the MCDE (less capital and salaries of study center supervisors)	848,992.00
Study center share = 72%	611,274.00
Plus salaries of study center supervisors	670,000.00
Total direct government support for study centers	1,281,274.00
Cost per student (17,000 students)	75.37

*Source:* Author's calculations from MCDE records and Ministry of Education and Culture data.

**Table 7.8** Total Government Contribution to the MCDE Study Center System  
by Capital and Recurrent Costs, 1984/85 and 1987/88  
(1985 Malawi kwacha)

<i>Cost</i>	<i>1984/85</i>	<i>1987/88</i>
<i>Capital costs</i>		
MCDE building <sup>a</sup>	69,915	94,024
MCDE equipment	36,925	50,000
Study center buildings <sup>b</sup>	858,900	1,002,050
Study center equipment and books	27,800	32,433
Total capital costs	993,540	1,178,507
<i>Recurrent costs</i>		
MCDE running costs	428,000	321,723
Ministry of Education and Culture supervision costs	60,000	60,000
Malawi Broadcasting Corporation transmission costs	136,592	136,592
Study center supervisors and teachers-in-charge <sup>c</sup>	260,300	352,632
Total recurrent costs	884,892	870,947
<b>Total capital and recurrent costs</b>	<b>1,878,432</b>	<b>2,049,454</b>

a. Overall staff numbers rose from 87 to 117 and the MCDE has more space. Take the figure calculated for 1984/85 in appendix 1 and apply 117/87.

b. The number of study centers rose from 90 to 105.

c. MCDE records show 361 teachers receiving MK670,000 and apply inflation.

*Source:* Same as table 7.7.

The most significant change in the costs over the four years is the dramatic increase in the cost of study center supervisors and teachers-in-charge. In 1984/85 their costs were 29.4 percent of the total government recurrent expenditure on study centers. By 1987/88 this had risen to 40.4 percent. While student numbers increased 21 percent from 14,000 in 1985 to 17,000 in 1988, the number of study center supervisors and teachers-in-charge increased 50 percent. This increase brought the student/supervisor ratio from 58:1 in 1985 to 47:1 in 1988. Combined with a salary increase, the increase in numbers has raised the total cost in real terms by 35 percent.

Costs per student for the two years can now be calculated and compared. For 1987/88, the cost per student was MK120.56 (1985 Malawi kwacha), of which MK51.23 was recurrent costs and MK69.32 was capital costs, while for 1984/85, the cost per student was MK134.21, of which MK63.22 was recurrent cost and MK70.99 was capital costs.

Fixed and variable costs can also be calculated for 1987/88. Based on the figures in table 7.8 and keeping the MCDE's running costs at 43 percent fixed and 57 percent variable (the case in 1984/85), the total fixed costs are MK478,957 and the total variable costs are MK1,570,497 (in 1985 Malawi kwacha).

### **Comparing the Costs of Day Secondary Schools and Study Centers**

The costs of the day secondary schools in Malawi will now be analyzed and the cost per student, the cost per junior certificate examination pass, and the cost per subject pass calculated and compared with the costs of the study center system.

#### *Costs of Day Secondary Schools*

Malawi has four types of secondary schools: private, government boarding, government day, and government aided. Government direct expenditure per pupil in 1984/85 on the last three of these was MK543.66, MK209.75, and MK245.49 respectively (personal communication, Ministry of Education chief accountant's calculations). As government boarding schools account for a very small number of students (910) overall, and the costs include food and accommodation, these will be excluded. The costs of government-aided secondary schools will also be excluded as determining total expenditure is difficult because the organization (usually religious) running the school meets some of the costs.

Day secondary schools accounted for more than 50 percent of secondary school enrollments in secondary schools in 1984/85. Although these are considered day schools, as with the study centers, the community often provides hostels nearby where students can stay for a fee. Appendix 2 analyzes total expenditure on day secondary schools in 1984/85. The government recurrent costs per student were MK279.28 while the capital costs were MK340.00. Table 7.9 summarizes the results of the analysis in appendix 2.



**Table 7.9** Costs of Day Secondary Schools per Student by Contributor and Type of Cost, 1984/85  
(Malawi kwacha)

Type of cost	Contributor			Total cost
	Government	Parent/student	Community	
Capital	340.00	0	32.55	372.55
Recurrent	279.28	156.35	0	435.63
<b>Total</b>	<b>619.28</b>	<b>156.35</b>	<b>32.55</b>	<b>808.18</b>

Source: Author's calculations from Ministry of Education data.

### *Costs per Student Compared*

Table 7.10 compares government expenditure on the two systems.

**Table 7.10** Comparison of Government Expenditure per Student in Day Secondary Schools and Study Centers by Type of Cost, 1984/85  
(Malawi kwacha)

Type of cost	Study centers	Day secondary schools	Ratio of expenditure, day secondary schools: study centers
Capital	70.99	340.00	4.8
Recurrent	63.22	279.28	4.4
<b>Total</b>	<b>134.21</b>	<b>619.28</b>	<b>4.6</b>

Source: Author's calculations from unpublished data.

As table 7.10 shows, the government spends between four and five times as much on each student in the day secondary schools as it does on each student in the study centers. The two main reasons are the high cost of building secondary schools and the high cost of the teaching staff in those schools. The day secondary school buildings have well-equipped and furnished classrooms, laboratories, and specialized workshops and up to nine teachers' houses. The study centers consist of simple two-classroom blocks with no laboratories or workshops and no more than three teachers' houses. The teaching staff in secondary schools cost more because the average teacher in a secondary school is paid three times more than the supervisor in a study center, and because of the lower student-teacher ratio of 21:1 in secondary schools compared with 58:1 in study centers (1984/85).

The cost of teachers in day secondary schools in 1984/85 was MK139.16 per student, or almost 50 percent of the total government recurrent expenditure on day secondary schools. The cost in the study centers was MK18.59 per student, or only 29.4 percent of the government recurrent expenditure.

### *Costs per Junior Certificate Pass Compared*

For most students in both secondary schools and study centers, their principal goal is to pass the Junior Certificate Examination. Table 7.11 shows the numbers passing and the costs per pass.

**Table 7.11** Costs per Junior Certificate Examination Pass by System of Study, 1985

<i>System of study</i>	<i>Total numbers in JC years</i>	<i>Total expenditure on JC students (MK)</i>	<i>Number of JC passes at one sitting</i>	<i>Cost per JC pass (MK)</i>
Study center	13,000	1,744,730	888	1,965
Day secondary school	6,038	3,739,213	2,447	1,528

*Note:* The costs of the study centers to date and of the day secondary schools include the costs of all students, that is, they include those studying in the two years of senior secondary school. Thus, the total cost of the junior group has to be calculated by multiplying the numbers in junior secondary school by the average cost per student. This total is then divided by the number passing to get the cost per pass.

*Source:* Author's calculations, unpublished data, Malawi National Examinations Board records.

Based on table 7.11, the cost of a JC pass is apparently less in the day secondary school system than in the study center system. However, we must remember that day secondary school students are chosen from among the best performers in the primary school leaving examination, while study center students are admitted if they have simply passed the examination. Thus, study center students start from a weaker base.

### *Costs per Subject Pass Compared*

Another measure of output is the number of subject passes in the junior certificate examination. In 1985, students from day secondary schools achieved an estimated 24,482 subject passes, while study center students achieved 12,725 subject passes. Using the same total costs as given in table 7.11, this works out to a cost of MK137 per pass for study center students and MK154 per pass for day secondary school students. Thus, the study center system appears to be a more cost-effective way of getting subject passes than the day secondary school system. Note, however, that the subject pass measure does not give the actual level of achievement, and students in day secondary schools are likely to be achieving significantly higher grades than study center students.

*Costs in 1987/88*

While data for 1987/88 were not as readily available as for 1984/85, some analysis was possible. The cost per student for day secondary schools in 1987/88 (Ministry of Education and Culture) was MK309.29, or MK162.78 in 1985 kwacha. Using the earlier calculations for day secondary school costs (appendix 2) and assuming that the costs for Ministry of Education and Culture supervision and broadcasting are similar, we can calculate the ministry's costs of running day secondary schools in 1987/88 and compare these costs with the costs of study centers in 1985 prices (table 7.12). As the table shows, the government's expenditure per student in day secondary schools was 4.7 times its per student expenditure in study centers, compared to 4.6 in 1985.

**Table 7.12** Comparison of Government Expenditure per Student in Day Secondary Schools and Study Centers by Type of Cost, 1987/88 (1985 Malawi kwacha)

Type of cost	Study centers	Day secondary schools	Ratio of expenditure, day secondary schools: study centers
Capital	69.32	340.00	4.9
Recurrent	51.23	232.31	4.5
Total	120.56	572.31	4.7

Source: Unpublished Ministry of Education and Culture data.

As for costs per junior certificate pass, these are shown in table 7.13.

**Table 7.13** Costs per Junior Certificate Examination Pass by System of Study, 1988

System of study	Total expenditure on JC students (1985 MK)	Number of JC passes at one sitting	Cost per JC pass (1985 MK)
Study center	1,687,840	3,931	429.37
Day secondary school	4,093,161	3,278	1,248.68

Source: Malawi National Examination Board and Ministry of Education and Culture data.

As tables 7.11 and 7.13 show, from 1985 to 1988 the cost per pass for day secondary schools dropped from MK1,528 to MK1,249. This may be explained by the increasing

percentage of passes in secondary schools. In 1985, 75 percent of school candidates passed at one sitting; in 1988, 93 percent passed at one sitting. The costs per JC pass in the study center system also fell between 1985 and 1988. In 1985 each junior certificate pass cost MK1,965, but by 1988 had fallen to MK429. This reduction is explained by the large number of study center students who passed in 1988 (55 percent of those taking the examination passed at one sitting compared to 15 percent in 1985). Thus, while total student numbers have increased by 7.7 percent, junior certificate passes have increased by 354 percent.

## Conclusions

This chapter examined whether the study center system is more cost-effective than day secondary schools when the following measures are considered: access to second-level education, examination passes in the junior certificate examination, and subject passes in the junior certificate examination.

On the first measure—access to second-level education—the evidence is clear. The study center system does provide cheaper access to second-level education than the regular day secondary schools. The total cost to the government of providing access to secondary schools is between four and five times as much as the cost of providing access to the study center system.

On the second measure—junior certificate examination passes—the evidence is less clear. The day secondary school system produced junior certificate graduates more cheaply in 1985 than did the study center system; however, in 1988 the cost of producing junior certificate passes was less in the study center system than in the secondary schools. Given that comparing study center students with day secondary school students is not comparing like with like, since study center students start from a weaker base, this is an extraordinary finding. The cost figures also indicate that if the current ratio between costs in day secondary schools and costs in study centers holds, the study center system will be more cost-effective than the day secondary school system on the important measure of examination success if 20 percent or more of its students pass the examination at one sitting.

When success by subject pass is compared, the evidence is clear: study centers are producing subject passes more cheaply than secondary schools, and the subject pass may be a more realistic measure of learning gained than a full pass in the junior certificate examination. While it did not prove possible to determine the cost per subject pass in 1988, given the improvement in overall results in 1988, the cost per subject pass in 1988 was likely to be significantly less in the study center system than in day secondary schools.

A number of reasons account for the study center system's cost advantages. The big factor in the capital costs is the difference in the costs of building secondary schools compared to the costs of building study centers. In the recurrent costs, the main factor is the difference between the cost of secondary teachers and the cost of study center supervisors. Secondary teachers cost more per student and make up a larger percentage of total costs than study center supervisors.

It will be necessary to continue to monitor costs and results to determine how the trend moves over time. Ideally, student achievement in study centers should be

compared with student achievement in secondary schools against the background of the primary school leaving examination results of the students entering each system.

### **Options for Policymakers**

While the evidence on effectiveness does not indicate that the study center system is currently providing a high quality education, the evidence does suggest that standards, as measured by examination success, are rising. The 1988 results were excellent and indicate what other countries can achieve.

When the findings on costs are taken together they favor the continued investment by the government of Malawi in the study center system. The results suggest that the government could increase access to second-level education by a factor of four without increasing costs. They also indicate that the achievement of examination pass rates in excess of 20 percent would make the study center system more cost-effective than regular secondary schools on this important measure. However, the factors that determine the cost differences between the two systems, building costs and face-to-face support costs, should be monitored continually to ensure that the cost advantages of the study center system are maintained.

These findings should encourage other governments facing problems similar to Malawi's to experiment with study center systems so that many more students have access to a second-level education. Among the options identified in chapter 6 are replacing all secondary schools by study centers, expanding access to second-level education only through study centers, and providing all junior secondary education through study centers and senior secondary through traditional schools. The advantages and disadvantages of these policy options have been discussed in chapter 6. Here I will concentrate on the cost advantages.

The main advantage of the first option—replacing all secondary schools with study centers—is the huge increase in access provided. For the same cost four times as many children can get a second-level education. This option may be of interest to countries with very low numbers participating in second-level education.

The second option is to increase access to second-level education using only study centers. The main advantage is the relative economy of providing more places, which may be of interest to countries with a significant proportion of the age range currently not participating in second-level education.

The third option is to provide all junior secondary education through the study centers. In Malawi, for example, it would theoretically be possible to increase the numbers participating in second-level education at no extra cost from the current 45,000 (secondary schools and study centers combined) to 70,000 by providing all junior secondary education in existing study centers for a further 20,000 students. In practice it would not be possible to trade off the cost of the 8,000 existing secondary school places for an additional 35,000 study center students because the secondary schools are already built and the teachers are trained. However, what Malawi could choose to do is to increase access to secondary education by converting all the existing secondary schools into senior secondary schools, thereby providing places in senior secondary school for 28,000 students and providing the study centers with an additional 17,000 places. While

a significant and immediate investment in redevelopment and training would be required, the recurrent cost implications of this change would not be great.

Thus, the study center system offers significant opportunities for increasing access to a second-level education at a relatively low cost. Governments faced with growing numbers of primary school leavers seeking a second-level education should consider how best to take advantage of these opportunities. When providing increased access through study centers, governments should ensure that they do not create a second-rate, under-resourced system that attracts only those students who have not performed well in primary leaving examinations.

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## APPENDIX 1

## NOTES ON MCDE COST CALCULATIONS

Table 1 takes all the MCDE's recurrent costs for 1984/85 and assigns them to five different categories: central costs, work outside the MCDE (the MCDE does some printing work for the Ministry of Education and Culture and the examinations body), study centers, home study, and night secondary schools. The allocation to each activity is based on discussions with senior MCDE staff. Central costs are those costs that would

Table 1 Analysis of the MCDE's Recurrent Costs, 1984/85  
(Malawi kwacha)

Category	Total	Central	Outside MCDE	Study centers (N=14,000)	Home study (N=3,000)	Night secondary school (N=2,000)
<i>Personnel costs</i>						
Principal's office	14,500	14,500	0	0	0	0
Administration	67,500	0	13,500	44,470	4,765	4,765
Printing	45,700	0	11,500	28,200	3,000	3,000
Research & evaluation	14,500	14,500	0	0	0	0
Tutorials & student services	39,000	39,500	0	0	0	0
Schools' broadcasting unit	24,000	6,000	18,000	0	0	0
Part-time actors, writers & editors	88,700	58,700	30,000	0	0	0
Subtotals	293,900	132,700	73,000	72,670	7,765	7,765
<i>Other costs</i>						
Vehicles & travel	47,400	0	0	39,035	4,182	4,182
Postage	11,600	0	0	9,554	1,024	1,024
Utilities	21,500	21,500	0	0	0	0
Printing materials	130,000	0	0	107,060	11,470	11,470
Markers	19,000	0	0	15,647	1,676	1,676
Miscellaneous	29,800	29,800	0	0	0	0
Subtotals	259,300	51,300	0	171,296	18,352	18,352
Total recurrent costs	553,200	184,000	73,000	243,966	26,117	26,117
Percentage allocation excluding central costs			20	66	7	7

Notes: The allocations between study centers, home study, and night secondary schools are based on the numbers of students and a weighting for student activity. This assumes that each study center student is twice as active as a home study student and therefore needs twice as many courses, twice as much marking, etc. Night secondary school students are estimated to be 50 percent more active than home study students. These assumptions agree with MCDE staff estimates. Applying these activity weightings to student numbers in each system yields a 28:3:3 allocation. Work outside MCDE includes work to print examinations and brochures. Estimates of the costs of outside work are based on MCDE research.

Source: MCDE and the Ministry of Education and Culture.

have to be met if the MCDE were to have only one system of study, for example, there would have to be a principal's office. In calculating the total costs of running any of the study systems the central costs must be added in full.

As can be seen, MK243,966 was spent by MCDE directly on activities for study centers and a further MK184,000 was central costs that would have to be met if the MCDE only ran study centers. This yields a total recurrent cost of MK427,960 in 1984/85.

That same year, 14,000 students were studying in study centers, 2,000 in night secondary schools, and 3,000 at home.

### **Annualized Costs of Buildings and Equipment**

While accurate valuation of MCDE's buildings and equipment is not possible, the World Bank calculated the cost of providing a new building for MCDE as MK1,861,762 in 1985. As this building was intended to accommodate 138 full-time staff and the MCDE had 87 staff in 1985, we can estimate the cost of building for 87 staff at 87/138 times MK1,861,762, or MK1,173,719.

A formula for annualizing capital costs has been worked out that depends on the length of time over which the capital is to be depreciated ( $n$ ) and the social discount rate ( $r$ ). It is normal to annualize buildings over a period of fifty years. A number of authors have discussed the difficulties with the social discount rate (Jamison, Klees, and Wells 1978; Orivel 1980). For this exercise a rate of 7.5 percent will be used; however, alternative calculations using rates of 0 percent and 15 percent are given later.

If the cost of the MCDE building is annualized over fifty years at 7.5 percent, the annualization factor using the formula  $a(r,n) = [r(1+r)^n]/[(1+r)^n - 1]$  is 0.77, or MK90,376. So for study centers, if we assume that the space requirement is the same proportion of total space as their expenditure is of total expenditure, then this gives

$$\frac{427,966}{553,200} = 77.36\% \text{ (see table 1)}$$

$$77.36\% \text{ of MK90,376} = \text{MK69,915}$$

It is normal for architects to estimate equipment and furniture costs as 20 percent of building costs. However, a distance teaching institution has particularly expensive equipment needs for offset printing, plate making, and recording equipment. Accordingly, a higher figure, say 33 percent, is more appropriate. This yields a total capital cost of MK391,240 for furniture and equipment for all MCDE.

Calculating the period of depreciation is difficult. A good quality offset printer could last twenty years; a plate maker might last ten or twelve years. As an approximation, I have assumed that half the equipment has a life of twenty years and half a life of ten years. Using the formula to determine the annualization factors (0.146 for ten years and 0.098 for twenty years) and applying these gives a total of MK47,731. Applying 77.36 percent yields MK36,925.



## **Ministry of Education and Culture: Supervision Costs**

The MCDE is a department of the Ministry of Education and Culture. The principal of the MCDE reports to the principal secretary of the ministry. Ministry officials help MCDE by providing the junior certificate examinations and marking them. In addition, regional education officers provide some supervision of study centers. While it is not possible to allocate precisely the amounts the ministry spends in directly supporting the MCDE's work, discussions with senior MCDE and ministry staff indicate that it is of the order of four full-time senior staff members and the overheads associated with them. Assuming salaries at MK7,500 in 1985 and overheads at the same again, this yields MK60,000 in 1985.

## **Malawi Broadcasting Corporation Costs**

Obtaining a detailed analysis of the costs of the Malawi Broadcasting Corporation (MBC) in 1985 or an estimate of the costs of MBC's buildings and equipment did not prove possible. However, a 1983 study reports that: "MBC had in 1980 calculated that their costs were K840 per hour: this included amortization of the capital costs of the broadcasting service, staffing and running costs, and notional losses of advertising revenue" (Perraton, Jamison, and Orivel 1983, p. 174).

This cost includes producing and broadcasting as well as transmitting, thus the figure of MK840 in 1980 is an overestimate of transmission costs. Using this figure and the average annual inflation rate of 12.4 percent that Malawi experienced between 1980 and 1985 (World Bank 1988b, p. 270), this yields a cost per hour of MK1,507 in 1985. MCDE programs for secondary students took up 250 hours a year for a total cost of MK376,750. However, as the programs are aimed at all secondary school students, the costs should be shared between the MCDE and the school system. Assuming the costs are shared equally, the MCDE's share is MK188,375. However, the MCDE's other students also listen to the programs, thus the study center system's share based on the number of students is MK136,592.

## **Direct Study Center Costs**

Direct study center costs comprise supervisors' salaries; the annualized costs of radio receivers, books, electricity, and so on; and the annualized costs of buildings. In 1984/85, supervisors' salaries amounted to MK260,300. That same year, a radio receiver cost MK100, a tape recorder cost MK150, and books for each of the ninety study centers cost MK1,000, giving a total cost of MK112,500. Discounting this at 7.5 percent over five years gives a total annual cost of MK27,788. Students in some study centers pay MK2 an average per term for electricity and batteries. Therefore, the total estimated cost is MK84,000 (MK30,000 for batteries, MK54,000 for electricity). Finally, the cost of building and equipping a study center for 100 students was MK79,680, which discounted over 50 years at 7.5 percent yields an annual cost of MK6,135, or MK61.35 per student. This gives a total of MK858,900 per year.

### Student/Parent Costs

Students pay MK90 per year (MK30 a term) to the community for food and accommodation in Nkata Bay hostel. Students must also pay transport costs to and from home three times a year. Interviews with teachers-in-charge and supervisors indicate that the average cost is MK6 per student per year. The total cost, therefore, is MK96 per student.

There is no cost for loss of earnings while students are in the study centers, though this is often an important factor in comparing the costs of distance education programs with the costs of traditional alternatives. This is because Malawi has a surplus of labor. Keeping students in study centers (or in schools) is not likely to reduce overall production in the economy. There may even be a case for arguing that these young people would retard production if not in school, as they would probably become smallholders, thereby reducing the amount of land available to the more productive estates (Livingstone 1984, pp. 122-125).

### Choice of Social Discount Rate

While 7.5 percent is the social discount rate chosen, one could argue that other rates are more appropriate. Indeed, Orivel (1980, p.23) has argued that a zero rate is the most appropriate. While this appears not to recognize the difference between spending money now and spending it ten years from now (Jamison, Klees, and Wells 1978, p. 33), nonetheless the effects of this choice on costs will be determined. The effect of choosing an interest rate of 15 percent on costs will also be determined (table 2).

**Table 2 Annualized Capital Costs of the MCDE Study Center System Using Three Rates of Interest**  
(Malawi kwacha)

<i>Item</i>	<i>0 percent</i>	<i>7.5 percent</i>	<i>15 percent</i>
MCDE building	18,160	69,915	136,198
MCDE equipment	22,700	36,925	54,328
Study center buildings	223,091	858,900	1,673,182
Study center equipment	22,500	27,800	33,525
<b>Total</b>	<b>286,451</b>	<b>993,540</b>	<b>1,897,233</b>

*Source:* Author's calculations.

Choosing 0 percent as the rate of interest reduces the overall costs of the MCDE study center system by MK707,089, which represents a reduction of 19 percent in the total costs of the study center system. More important, as the government meets all

capital costs, it represents a 38 percent reduction in the government's contribution. Choosing an interest rate of 15 percent increases the total costs by MK903,693, which represents a 24 percent increase in total costs and a 48 percent increase in costs to the government.

These calculations clearly show that the choice of an interest rate has a major impact on the final costs of the MCDE study center system. However, note also that the choice of interest rate does not affect the relationship between the cost of the study center system and the day secondary school system, as the same interest rate is used for each.

## APPENDIX 2

MALAWI GOVERNMENT EXPENDITURE  
ON DAY SECONDARY SCHOOLS, 1984/85

Expenditure on Day Secondary Schools in Malawi, 1984/85  
(Malawi kwacha)

<i>Item</i>	<i>Total cost</i>	<i>Per student</i>	<i>Notes</i>
<i>Recurrent</i>			
School running costs	2,110,687	209.75	10,063 students
Administration of Ministry of Education and Culture	605,191	60.14	20 percent of total ministry administrative cost of MK6,051,913 assigned to secondary, and per student numbers to day secondary
Malawi Broadcasting Corporation transmission	188,375	9.39	Broadcasts to junior secondary only assigned across all school students
Total recurrent costs		279.28	
<i>Capital</i>			
School buildings, furniture, and equipment		340.00	1,325,200 to build and equip 300-place day secondary school
<i>Student costs</i>			
Boarding and transport		111.35	MK102.35 actual cost of food and staff plus MK9 for transport
Books, etc.		45.00	Wolff 1984, p. 52
Total student costs		156.35	
Hostels		32.55	Calculated as for study centers

Source: Ministry of Education and Culture.

# Part III

## DISTANCE EDUCATION FOR TEACHERS

While Sub-Saharan African governments have yet to accept fully distance education's potential to increase access to good quality second-level education, its achievements for teacher education are more widely recognized. An increasing body of evidence indicates that for primary school teachers, traditional residential pre-service training is not cost-effective. Long residential courses tend to be expensive, and teachers' salaries are often linked to the length of their training. Thus, policymakers in some countries, for example, Burkina Faso, have shortened the duration of pre-service training for primary school teachers. Other countries have substantially lowered the cost of pre-service training by using distance education, for example, Nigeria, Tanzania, and Zimbabwe. Some countries have also used distance education to provide in-service training, usually for underqualified teachers who are already employed in schools. The methods used for both pre-service and in-service training generally involve a combination of self-instructional materials, residential courses, and supervision in schools.

Curran and Murphy (chapter 3) found that three of the six countries they studied—Kenya, Lesotho, and Zimbabwe—had used distance teaching for teacher education. They reported that the results in Kenya and Lesotho were excellent, while results in Zimbabwe were good. Perraton (chapter 2) also found that distance education for teachers had been effective. Chivore (chapter 8) and Chale (chapter 10) provide us with further data of the effectiveness of teacher education at a distance in Zimbabwe and Tanzania. For each country they report on studies that compared the effectiveness of teachers trained conventionally and teachers trained using distance education.

More projects have used distance education to provide in-service education to underqualified teachers as they continue to work in schools than to provide pre-service education. The methods used are very similar to those used for pre-service training. Kinyanjui (chapter 9) describes Kenya's experience. He focuses on the need for large numbers to realize economies of scale. Some of the initial costs in developing the self-instructional materials and training the instructors and others involved are substantial and can only be justified if the numbers are large enough.

Despite the number of teacher education projects in Africa that have used distance education, little precise information on costs is available. Chale (chapter 10) compares the costs of the distance education system and the traditional residential system in Tanzania. He provides a thorough analysis of the costs of a program that used distance education to qualify teachers and compares these costs with the costs of training teachers conventionally. Taken together with the findings on effectiveness, this is a very welcome addition to the literature.



# 8

## PRE-SERVICE TEACHER EDUCATION AT A DISTANCE: THE CASE OF ZIMBABWE

*B. R. S. Chivore*

On attaining independence, virtually all the African countries, embarked on a massive expansion of educational provision at all levels. Zimbabwe is no exception. On attaining independence in 1980, Zimbabwe faced the political, economic, and social challenges that normally accompany attempts to build a new nation. In the social area, the government undertook massive and unprecedented expansion of education at both the primary and secondary levels. In 1979, Zimbabwe had 2,401 primary schools with an enrollment of 819,586 pupils. By 1989, the country had 4,504 primary schools with an enrollment of 2,274,178 pupils. At the secondary level, in 1979 there were 177 secondary schools with an enrollment of 66,215 pupils. By 1989, the country had 1,502 secondary schools with an enrollment of 695,882 pupils. As table 8.1 shows, the number of both trained and untrained teachers at the primary level has increased dramatically since independence.

**Table 8.1** Teacher Numbers at the Primary Level, 1980-85

<i>Year</i>	<i>Number of trained teachers</i>	<i>Number of untrained teachers</i>	<i>Total</i>
1980	20,424	8,031	28,455
1981	22,654	15,119	37,773
1982	23,699	21,768	45,465
1983	25,954	26,548	52,502
1984	30,424	24,000	54,424
1985	31,496	26,752	58,248

*Source:* Ministry of Education data.

The demand for teachers outstripped the supply from the country's conventional colleges (table 8.2). In response, the government launched a number of unconventional approaches for training nongraduate teachers for both primary and secondary schools.

**Table 8.2** Output of Teachers from Conventional Colleges, 1980-83 (number of teachers)

<i>Year</i>	<i>Conventional college output</i>
1980	680
1981	666
1982	642
1983	1,244

*Source:* Ministry of Education data.

### Teacher Education

Although teacher education is sometimes used interchangeably with teacher training, teacher education is far more than teacher training. Teacher education includes teaching students not only to teach within the four walls of the classroom, but how to base this teaching on sound theoretical knowledge. This knowledge enables teachers to guide their pupils' learning experiences, contribute to the growth and development of people who come into contact with them, and contribute to the development of society at large. Teacher education, whether formal or nonformal, consists of programmed activities and experiences developed by an institution responsible for preparing people to work as professional teachers.

As already mentioned, the government devised new strategies to train teachers to meet the excess demand created by the expansion of educational provision. These include the following:

- The Zimbabwe Integrated National Teachers Education Course (ZINTEC),
- The four-year conventional teacher education program,
- The three-year conventional teacher education program.

### The ZINTEC Program

ZINTEC, initiated in 1981, is the most highly acclaimed post-independence teacher education program in Zimbabwe. ZINTEC students undertake two long periods of study in one of five colleges at the beginning and end of the program, and shorter periods each year in between. When the students are not in college they are assigned to schools to teach. During this period they are helped with distance teaching materials and supervised by college lecturers. They are also supervised by school principals and education officers.

The ZINTEC program was originally based on several assumptions, including:

- Zimbabwe's conventional teacher education system could not meet the new level of demand for teachers.
- New teachers should be produced in line with the enunciated ideology of socialism. As the deputy minister of education (*Herald Newspaper*, April 21,



1982) put it: "We are instituting an education ideology which should be a means of transforming our society, one that will eventually dispel ignorance, fear, poverty, disease and the mental colonization [sic] under which our people have lived for nearly a century."

- The teacher and teacher education have roles to play in Zimbabwe's development process. To that end, on the job training was needed to blend theory with practice.
- Education is a basic human right. Thus, every child in Zimbabwe has a right to education. This meant that the country needed a large teaching force capable of working under difficult and trying conditions.

### *Rationale for ZINTEC*

The decision to start the ZINTEC program and those that followed it (the three- and four-year programs) was related to the political decision to make primary education free and compulsory. The expansion of primary education meant that more professionally trained teachers were needed. The country could not use the old three-year conventional system to produce teachers because this system produced inadequate numbers of teachers. Hence ZINTEC student teachers were deployed in primary schools after their initial sixteen-week (now twenty-four-week) orientation courses and received the bulk of their training on the job through distance education.

A second justification for introducing the ZINTEC program was professional. As stated in the *Handbook on Student Teaching*:

More and more, in the teaching profession as well as industry, on-the-job training, with increased opportunities for the trainee to integrate the theoretical and practical learning is being seen as having long term pay-offs both for the individual trainee as well as for the profession. The argument seems to be that it is more effective to train teachers while they are at school for longer periods than was the case under the three-year conventional training (1983, p.2).

As Ncube (1983, p.48) put it:

There is a great deal of interaction during this stage between the student teacher on the one hand and the education world on the other. They (student teachers) see the problems of teaching and education as they are. Whatever solutions emerge are practical in the sense that the student teachers are constantly grappling with those problems both within and outside the school just as they would as full teacher practitioners in a normal school/community.

A third reason put forward to support the ZINTEC program relates to the cost of training teachers. The program enabled more teachers to be trained than the three-year conventional scheme without building new colleges. An evaluation (Ministry of Education 1986) concluded that the cost of training teachers under the ZINTEC program was cheaper than the three-year conventional program.

### *Objectives of the ZINTEC Program*

The main aims and objectives of the ZINTEC program included the following (Chivore and Masango 1982, p. 29):

- To address the shortage of primary school teachers through in-service teacher education;
- To develop a teacher education system relevant to the specific problems facing people in their everyday life;
- To develop a teacher education program guided by Zimbabwe's socialist ideology;
- To effect developmental changes through teacher education;
- To develop a professional teacher with the skills needed to provide pupils with active learning experiences, for example, the concept of education with production;
- To develop an all round primary teacher with positive attitudes and values who would promote meaningful involvement in community development.

### *Entry Requirements*

To train as a teacher under the ZINTEC program, the entry requirements were exactly the same as those needed by any nonuniversity graduate under the conventional programs: five o-levels plus a language (now English language). Each ZINTEC college had three intakes of students per year averaging a total of roughly 800 students per intake. Thus, each year the four ZINTEC colleges enrolled a total of at least 2,400 students.

### *ZINTEC's Organization*

When the ZINTEC program started, it consisted of the National Center based in Harare and the colleges and their external wings. The National Center consisted of the Administration Unit, the Production Unit, and the Evaluation and Coordination Unit.

The Administration Unit consisted of the director, the senior executive officer, and an executive officer. The Administrative Unit had overall responsibility for the whole program, including liaising with the Head Office on matters relating to teacher education; liaising with regional officers on the recruitment and deployment of student teachers; liaising with the University of Zimbabwe on certification of students; initiating seminars, workshops, and vacation courses; and generally supervising ZINTEC colleges. It is this unit that was responsible for ensuring that distance education materials were distributed to students through the ZINTEC colleges.

The Evaluation and Coordination Unit was responsible for planning research and evaluating the ZINTEC program. These duties included assessing the program's aims and objectives, testing distance education modules produced by the Production Unit, coordinating assessment procedures, and assessing human and material resources. At the end of 1982 this unit was moved to the Head Office of the Ministry of Education, where it became part of the Planning Division to evaluate not only ZINTEC, but all the ministry's educational programs.

The Production Unit was responsible for writing all the distance learning materials student teachers used when they were deployed in the schools, seeing to it that they were dispatched to the regions through ZINTEC colleges, writing and modifying

syllabuses, attending seminars in the regions, and testing the written materials. Currently (1990), the Production Unit writes distance teacher education modules for all nongraduate teachers' colleges.

Writing on the role of the National Center, Ncube (1983, p.46) noted:

It may be appreciated that the National Center is basically the initiator and coordinator of all ZINTEC activities in Zimbabwe. It is the watchdog of ZINTEC objectives as envisaged by the founders of this teacher education program. There is also a sense in which the National Center is representative of the new thrust in terms of educational practice and interpretation in Zimbabwe (1983, p. 46).

When the program started, it had five regional centers: Mashonaland (in Harare), Manicaland (in Mutare), Gwanda (in Gwanda), Masvingo (in Masvingo), and Midlands (in Gweru). Regional centers were responsible for supervising and monitoring students on teaching practice and in their distance education modules. Following a 1982 evaluation (Chivore and Masango 1982), the regional centers merged with ZINTEC colleges to become the external wings of the colleges.

The four colleges under the program are Morgan (in Harare), Andrew Louw (in Masvingo), Marymount (in Mutare), and Gwanda (in Gwanda). Their main functions can be divided into two main categories: those relating to the residential courses and those relating to the supervision of students deployed in schools. In 1988, however, only two colleges, Morgan and Gwanda, remained as ZINTEC colleges, but as already noted, as far as distance teacher education is concerned, all nongraduate teachers' colleges receive material from the National Distance Education Center.

As concerns the residential portions of the ZINTEC program, the colleges are responsible for the initial sixteen-week (now two terms) courses and the final two-term courses. During the initial residential courses, students are introduced to the theory of education, that is psychology, philosophy, and sociology; the history of education in Zimbabwe; and applied education. In the subjects taught in primary schools, the final residential courses are devoted to preparing and writing final examinations.

### *Student Supervision Program*

Students learn both practical teaching and the theory of education. For nongraduate secondary student teachers, the course also includes teaching subjects such as history, geography, mathematics, and science. For nongraduate primary student teachers, distance education also covers applied education subjects, including social studies, English language, and Shona. In summary, the students' major activities include the following:

- Laying the professional foundations (theory of education) through distance education using modules prepared by the Production Unit of the National Distance Education Center;
- Reinforcing the distance education through vacation courses and weekend seminars;
- Practicing teaching on a full-time basis with the same responsibilities as qualified teachers.

During teaching practice, lecturers visit students at least once each term. School principals, district education officers, and education officers also supervise the student

teachers while they are on teaching practice. These officials submit reports on each student at least once a term to the students' colleges.

### *Certification*

Like all nongraduate teachers, candidates who train under the ZINTEC program are certified by the University of Zimbabwe, which maintains standards across the country. The university's Department of Teacher Education is responsible for assessing, approving, and monitoring the syllabuses followed by ZINTEC colleges. It brings in external examiners to moderate examinations (and even sends syllabuses to external examiners for moderation).

During their first two residential terms, students are assessed through assignments and short written tests, which help determine whether or not they proceed to the second phase. Note that examinations and tests taken during the students' first year are not used as part of their final assessment.

When the students are deployed in schools, in addition to teaching practice, they write assignments marked by their college tutors. A student is supposed to be visited at least five times by college lecturers or education officers before certification.

Since the program started, pass rates have been relatively high and the dropout rate insignificant. Table 8.3 shows the pass rates for seven recent program intakes.

**Table 8.3 ZINTEC Program Pass Rates at the University of Zimbabwe, Intakes 1-7**

<i>Intake</i>	<i>Total enrollment</i>	<i>Number of students graduating</i>	<i>Percentage graduating</i>
1	729	540	70.1
2	687	498	72.5
3	777	636	81.9
4	806	672	83.4
5	795	647	81.4
6	778	687	88.3
7	722	653	90.4
<b>Total</b>	<b>5,294</b>	<b>4,333</b>	<b>82.0</b>

*Source:* University of Zimbabwe, Department of Teacher Education.

The percentage of those who finally qualified is higher than the figures provided. This is because the total percentages above exclude those candidates who did not complete the course with the rest of their intake. In 1989, for example, Morgan ZINTEC College held a special graduation ceremony for deferred students. The actual percentage for those who completed their course could be between 86 and 97 percent. It is interesting to note that the percentage of those who passed improved from 70.1 percent in intake 1 to 90.4 percent in intake 7. The average number of students who passed was 82.0 percent.

The other important point is that there is no significant difference between ZINTEC and conventionally trained primary teachers in terms of achievement as measured by performance in examinations and overall pass rates.

### **Distance Education in Conventional Teachers' Colleges**

Following experiences gained in the ZINTEC program, the mode of training nongraduate primary and secondary teachers changed from three to four years. As a national report (1984, p. 17) observed:

The success of ZINTEC revealed by the evaluation exercise resulted in the "Zintecisation" of teacher training colleges. In place of the 3 years conventional training program, a four year course comprising first year residential, second year on-the-job, third year residential and fourth year on-the-job has been instituted.

However, as already noted, in 1988 the training of nongraduate teachers in conventional colleges reverted to three years. Student teachers spent their first and third years at college and their second year in the schools as full-time teachers receiving their tuition through distance education modules from the National Center for Distance Education.

### **Evaluation**

Since the ZINTEC program started, the Ministry of Education, the United Nations Children's Fund (UNICEF), and other interested parties have carried out several evaluations. Whenever the ZINTEC program was evaluated, conventional teacher education programs were also evaluated.

#### *Reasons for Evaluating the ZINTEC Program*

ZINTEC underwent major evaluations in 1982 and 1986. The following were some of the main reasons why the ZINTEC program was evaluated (Chivore and Masango 1982):

- To determine the degree to which ZINTEC was attaining its purposes, aims, and objectives;
- To provide evidence on the value of the ZINTEC program necessary to those, both internal and external, providing funding;
- To provide data on the program and on teacher education needed for general educational planning (covering, for example, teacher supply and demand, college staffing, admission procedures, and the dual system of teacher education);
- To collect data essential for the continued ongoing improvement of the program;
- To have a critical but objective analysis of the main problems encountered and recommendations on how to handle them, beneficial not only to ZINTEC, but to education in general and teacher education in particular;
- To determine the impact and effectiveness of ZINTEC student supervision;
- To assess the cost-effectiveness of this type of teacher education.

*Highlights of the Evaluation Findings*

Only those findings with a bearing on distance education are discussed. These include ZINTEC's organization, staffing, student supervision, and the effectiveness of distance education.

**ZINTEC ORGANIZATION.** As already noted, following the 1982 evaluation, the Evaluation and Coordination Unit was moved to the Planning Division of the Ministry of Education. Chivore and Masango (1982, p.37), the report's authors, recommended that "the Evaluation Unit should become part of the Head Office, Planning Division but should continue monitoring such projects as the ZINTEC program as well as other innovations that may be launched."

When the ZINTEC program started, its regional centers and colleges were separate entities. The 1982 evaluation recommended that the colleges and regional centers should be administratively and physically united to facilitate closer coordination and cooperation between field- and college-based lecturers, and efficient use of facilities such as distance education modules and libraries.

**STAFFING.** The average lecturer-student ratio at the colleges was 1:40 in 1982, while the field lecturer-student ratio was 1:60. This staff shortage had adverse implications for the lecturers, whose workloads became very heavy in terms of visiting students, marking distance education assignments, supervising both theoretical and practical work, and holding vacation seminars. The staff shortage was not confined to ZINTEC colleges, but was also apparent in conventional colleges, which by 1982 had introduced distance education as part of their mode of training.

The quality and relevance of education in a developing country such as Zimbabwe depends on the quality and relevance of the teacher. Both evaluations established that the vast majority of ZINTEC lecturers, as well as those in conventional colleges, were university graduates, some with higher degrees, trained to teach at the secondary level. Those lecturers teaching at the primary level were not trained to teach at that level. Those teaching at secondary teachers' colleges were not trained in teacher education, let alone distance teacher education. Hence the evaluations recommended refresher courses in the form of workshops. Some candidates were sent abroad to take short courses in distance education.

**STUDENT SUPERVISION.** Field supervision of student teachers by lecturers formed one of the most important activities in the training of teachers through distance education. The 1982 evaluation in particular indicated that 80 percent of the student teachers were visited once per term, 8 percent were visited twice, while 12 percent had not been visited at the time of the evaluation. This is an inadequate number of visits, but was representative of what was taking place in the program as a whole at the time.

Submissions made to the Evaluations and Coordination Unit by a field lecturer voiced concern about the inadequacy of visits. One college wrote: "It is impossible to visit students regularly because of tutor-student ratios." Another college requested "more staff to facilitate for more visits to students and more face-to-face interventions with students." At the same time, 96 percent of the students who took part in the 1982 evaluation stated that field supervision by field lecturers was inadequate. The student

teachers rated this as the most crucial problem. The 1986 evaluation also highlighted the inadequacy of field supervision.

The 1986 evaluation analyzed the quality of the supervision carried out. It reported that lecturers spent more time checking schemes of work, lesson plans, and records rather than helping students reinforce concepts and skills and link theory with practice. This was partly due to the lack of funds, vehicles, and staff.

**EFFECTIVENESS OF DISTANCE EDUCATION.** The Evaluation Unit pre-tested modules produced by the Production Unit to assess their content, relevance, and comprehensiveness. One simple method used to determine if students understood the modules was to ask them to underline words and concepts in the modules that they did not understand. Students were also asked to define or explain certain terms such as hypothesis or telegraphic utterances. As the 1982 (p. 103) report notes: "In their written assignments, the majority of students failed to explain terms using their own words." Thus, it became clear that some of the modules were beyond the students' comprehension. Thus, the report recommended that the Production Unit produce simpler modules that reflected the student teachers' academic level.

As part of their continuous assessment, both ZINTEC and conventional students write assignments and projects as directed in their modules. The evaluations established that there were problems in the marking of these assignments. Lecturers were not up-to-date with the marking and were slow to return students' distance education assignments. This developed into a vicious cycle as students became demotivated and started to submit their assignments late. The end result was that students wrote and submitted assignments without the necessary feedback vital for their professional and academic growth. As the 1986 (p. 6) report observed: "The delay meant that students did not benefit from the tutors' comments since they (students) wrote the next assignment before receiving the first, second and sometimes third assignment." Other reasons why student teachers were late in submitting their assignments were a lack of reference materials at their schools of deployment, inability to carry out research, heavy work load (since they were also full-time teachers), and poor postal services in some areas.

**EFFECTIVENESS OF ZINTEC-TRAINED TEACHERS.** Teachers' effectiveness can be rated on their skills at lesson planning, using teaching and learning aids, classroom management, class management, language and communication, education with production, education and the community, extramural activities, pupil evaluation, and record keeping. The 1982 evaluation found that the majority of student teachers were effective at extramural activities, language and communication, teaching and learning aids, class management, record keeping, and classroom management. They were relatively ineffective at lesson planning, class evaluation, education with production, and education and the community. The reasons for this relative ineffectiveness included confusion between aims and objectives; some principals who told student teachers to follow the lesson and planning formats of their schools, with the result that student teachers could not put into practice what they were taught at college; and some colleges that did not equip their students with proper planning guidelines. In the 1986 evaluation, however, and in other subsequent studies (Chivore 1985, 1986a, 1989b) planning was not among the weaknesses of the ZINTEC students.

## **The Effectiveness of Distance-Trained Teachers Once Qualified**

The 1982 and 1986 evaluations of teacher effectiveness were carried out among student teachers. It is common knowledge that the fine efforts made when candidates are student teachers often evaporate once these same candidates become qualified teachers. Hence the importance of evaluating the effectiveness of professionally trained teachers (though admittedly distance education alone was not the only approach used to train these teachers).

Chivore (1989a), along with fourteen experienced educators, carried out a pilot study on the effectiveness of teachers trained since independence in the Harare region. The study analyzed teacher effectiveness in several areas, including class management. This included lesson introduction, lesson development, teacher-pupil interaction, questioning techniques, class control, pupil participation, and the amount of written work given. In five of the seven items—lesson introduction, teacher-pupil interaction, questioning techniques, class control, and amount of work given—ZINTEC-trained teachers were rated as the most effective. The pilot study observed that:

In order of strength, as far as class management was concerned, based on the type of training received, the position was as follows: ZINTEC, four-year conventional and finally three-year conventional (Chivore 1989a, p. 20).

Even though this pilot study focused only on the Harare region, it is heartening to note that in terms of effectiveness, training on the job using distance education seems to be an effective method of training pre-service, nongraduate teachers.

## **Problems Encountered by Student Teachers Trained Through Distance Education**

During both the 1982 and 1986 evaluations, student teachers were asked to write down problems they encountered during their training, particularly during the deployment period. The problems mentioned by these students were basically similar to those already discussed. They included the following:

- Inadequate supervision by the lecturers;
- Lack of feedback on assignments and projects to students from lecturers;
- Lack of books during deployment;
- Poor postal services in some areas that hindered communication between colleges and students;
- Relatively heavy teaching loads, which resulted in some student teachers failing to strike a proper balance between their duties as student teachers and their duties as full-time teachers.

Other studies have confirmed most of the above problems (Chivore 1986a, 1986b). The government has attempted to minimize most of these problems by implementing recommendations made in the evaluations.



## The Impact of Training Teachers through Distance Education

It is not possible here to cover all the contributions distance education has made in training nongraduate teachers in Zimbabwe. Despite the problems noted above, the ZINTEC program has had tremendous achievements, including implications for the cost-effectiveness of teacher training and in improved output of trained teachers. The result is that distance education has become a permanent feature of Zimbabwe's system of teacher education.

The 1986 ZINTEC evaluation concluded:

From the information collected by the evaluation team, it was established that the ZINTEC program was cost-effective. It was found to be more cost-effective than what used to be the conventional Teacher Education program. Furthermore the ZINTEC program produced more teachers than the conventional program.

Between 1980 and 1988, a total of 17,455 primary teachers completed their training in Zimbabwe (table 8.4).

**Table 8.4** Number of Primary Teachers Trained, 1980-88

<i>Year</i>	<i>Number of associate colleges</i>	<i>Number of teachers certified</i>
1980	5	322
1981	7	618
1982	9	809
1983	9	1,379
1984	13	1,958
1985	14	2,384
1986	14	2,162
1987	14	4,429
1988	14	4,394
<b>Total</b>		<b>17,455</b>

*Source:* University of Zimbabwe, Department of Teacher Education.

Note that the figure of 17,455 trained teachers includes only those candidates who completed their training at colleges that received associate status from the University of Zimbabwe. The figure excludes referred and deferred candidates, most of whom completed their training. Consequently, the final figure should be higher.

Note also the increase in the number of trained teachers from 1983 on. This is due to the teacher output from ZINTEC colleges.

## Teacher Education in Southern Africa

Almost every country in southern Africa emphasizes the need for universal primary education. However, one of the impediments that militates against universal primary education is the lack of trained teachers. Another problem seems to be too much experimentation in the training of teachers. During the past ten years, Zimbabwe has had three types of pre-service teacher training. These different patterns meant that the country has not developed a single system of teacher education based on well thought out plans and evaluations. Worse still, the ZINTEC program, which according to pilot studies (Chivore 1989a) is producing competent teachers, is apparently being systematically phased out even though the shortage of professionally trained teachers persists. Distance education is one way to solve the problem of too few trained teachers in southern Africa, especially for newly independent countries such as Namibia.

## Conclusion

Since attaining its independence, Zimbabwe has invested heavily in education. In the process of that investment, the government has introduced various types of teacher education programs. Prominent among them was the ZINTEC program, which brought with it distance education as a mode of training pre-service, nongraduate teachers. This innovation affected all forms of pre-service, nongraduate teacher education, in that for the first time in the country's history distance education played a prominent role in teacher education. What is now urgently required is a systematic and thorough impact evaluation of teachers trained since independence to assess their effectiveness. This is crucial because if money is spent producing incompetent, inefficient, and ineffective educators it is money wasted.

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# 9

## THE ORGANIZATION OF TEACHER TRAINING AT A DISTANCE WITH PARTICULAR REFERENCE TO KENYA

*Peter E. Kinyanjui*

Programs for distance training of teachers in Kenya go back some twenty years. The first post-independence Kenya Education Commission, under the chairmanship of Professor Simeon Ominde, was set up to look into the whole of Kenya's educational system, and has influenced and guided national policy for education since independence. It was the Ominde Commission that first proposed the establishment of radio/correspondence education by the Ministry of Education. The commission urged consideration of a combination of lessons by radio with an approved correspondence course (Government of Kenya 1964). Thus, the Correspondence Course Unit was set up in 1967 at the University College Nairobi (now the University of Nairobi), with initial financial assistance from the United States Agency for International Development.

Since that time, considerable development has taken place and the whole concept and practice of correspondence education in Kenya has expanded to include tutoring at a distance, which is linked to other forms of supportive and integral media. Hence the use of a more comprehensive term—distance education—and the renaming of the Correspondence Course Unit to the Department of Distance Studies, which is part of the College of Education and External Studies of the University of Nairobi.

### **In-Service Courses for Primary Teachers**

The Ministry of Education first launched in-service courses for untrained primary teachers through distance teaching in 1969. The program continued until 1977, was suspended, and was then revived in 1982. To date, approximately 20,000 primary teachers have received in-service training under this program, which is likely to continue for some time to come if all the untrained teachers, who account for about 30 percent of the total force of about 143,000 primary teachers, are to be professionally trained (table 9.1).

Table 9.1 shows that the total number of untrained teachers has continued to rise in the face of increases in the number of schools and pupils. In other words, the proportion of untrained teachers has remained constant at around 30 percent of the total teaching force. With the introduction of the eight-four-four system (eight years of primary education, four years of secondary, and four years of tertiary) of education in 1985 when the duration of primary education was extended from seven to eight years, an additional 13,500 untrained teachers were recruited into the service with the intention that they would undergo in-service training through distance education.

**Table 9.1** Primary Education: Growth of Schools, Pupils, and Teachers, Selected Years

<i>Year</i>	<i>Number of schools</i>	<i>Number of pupils</i>	<i>Number of trained teachers</i>	<i>Number of untrained teachers</i>	<i>Total number of teachers</i>	<i>Percentage of trained teachers</i>
1963	6,058	891,553	17,682	5,045	22,727	77.8
1968	6,135	1,209,680	27,485	10,438	37,923	72.5
1973	6,932	1,816,017	43,990	12,553	56,543	77.8
1978	9,243	2,994,892	63,912	28,134	92,046	69.4
1983	11,856	4,323,921	84,036	35,673	119,709	70.2
1988	13,403	4,986,121	100,319	42,789	143,108	70.1

*Source:* Ministry of Education.

### Organization of Distance Education Programs

The in-service courses are organized on a three-year cycle, that is, each cohort of about 3,000 teachers is enrolled in the distance education program and takes three years to complete the course before another group is admitted. The learners are required to take a total of fourteen subjects in specified clusters as shown in table 9.2.

**Table 9.2** Distance Education for Teachers: Required Subjects

<i>First year</i>	<i>Second year</i>	<i>Third year</i>
Professional studies	Professional studies	Professional studies
English	English	Business education
Mathematics	Mathematics	Home science
Science	Science	Social education and ethics
Riswahili	Kiswahili	Physical education
Music	Arts & crafts	Religious education
	Geography, history, and civics	Geography, history, and civics
	Agriculture	

The learning media package used in the in-service program consists of a correspondence component, which comprises about 75 percent of the course content. This is supported and supplemented by radio lessons broadcast over the Voice of Kenya. In addition, the students participate in face-to-face tuition for a total of seven weeks a year spread over the school holidays at residential primary teachers colleges. The

residential component comprises 25 percent of the course content. Every learner is assessed on a continuous basis throughout the three-year period with grades awarded for performance on the correspondence written assignments, the practical teaching, and the annual examinations.

### *Correspondence Component*

Correspondence study materials constitute the main medium of instruction. They are prepared by the Department of Distance Studies of the University of Nairobi following the teacher education curriculum approved by the Kenya Institute of Education. These study materials are developed in instructional units that are, to a large extent, self-contained and written in a manner that makes them highly interactive. It is assumed that the primary teachers have little or no access to textbooks or reference materials, and the study units therefore include all the basic information needed to understand the subject matter.

To involve the learners in active participation, activities and exercises are built into the text at appropriate intervals. The correspondence course writers adopt, as far as possible, the problem-solving approach in presenting the study materials so as to provide teachers with opportunities to apply what they have learnt.

The actual course content in the in-service program has two main objectives. First, it helps to update the teachers' academic knowledge of the fourteen subjects taught in primary schools. Second, it helps them acquire the skills and techniques needed to teach the various subjects.

Continuous assessment is an important part of the in-service program. The teachers are required to submit their written assignments at set intervals for marking and grading. The task of marking and grading the assignments is carried out by qualified tutors from teachers colleges and secondary schools who are paid on a piecework basis. All these tutors are required to undergo regular training in the methodology of tutoring at a distance. A substantial number of these tutors are recruited from primary teachers colleges to ensure the maintenance of standards prevailing at the pre-service teachers colleges. The Department of Distance Studies is responsible for maintaining all the records of the enrolled teachers and of their performance in the various subjects.

The delivery of study materials and basic textbooks is done through the District Education Offices or, when convenient, during the residential sessions held at the fifteen primary teachers colleges. This helps to minimize the losses and delays experienced when using the postal service.

### *Radio Component*

Radio lessons are designed to support and reinforce the correspondence component. They highlight some of the pertinent points or issues contained in the study units without necessarily repeating or summarizing them. Radio is thus used primarily to motivate the teachers and to pace them as they work through the study materials.

The preparation, scripting, and recording of the radio programs is done jointly by the Department of Distance Studies and the Educational Media Service of the Kenya Institute of Education. The radio lessons are then broadcast over the Voice of Kenya at

regular times with repeat broadcasts throughout the year. Each enrolled teacher receives a broadcast schedule together with any supplementary learning materials.

Over the years it has become evident that most teachers do listen to the radio lessons regularly and have found them useful as supplements to the correspondence study materials. It is also evident from discussions with the teachers and from their written assignments that the radio lessons have had a considerable impact on their learning. They often refer to "what the radio tutor said the other day," or "according to the radio message broadcast last week," and so on. The radio tutor seems to carry considerable authority, and the apparent immediacy of the messages conveyed through the radio is one of the main benefits listeners often quote. The listeners from the more remote parts of the country depend largely on radio for information about arrangements for residential sessions, examinations dates, and any unforeseen delays in the dispatch of study materials.

An audience survey conducted by the Voice of Kenya in 1985 revealed that some 750,000 people throughout the country had their radios on at the times when the teachers' programs were being broadcast. The "eavesdroppers" included other teachers who were not enrolled, but who found the radio lessons worth listening to.

It has also been established that some of the enrolled teachers have made arrangements to record the radio lessons and have shared them with their colleagues in group learning situations. One conclusion drawn from this modified use of radio programs is that the teachers value the audio component of the learning package, but the inflexibility of the radio schedules was a disadvantage to some of the teachers. The use of audio cassettes introduced the flexibility they needed.

### *Face-to-Face Component*

The face-to-face meetings take four different formats. First are the direct teaching sessions in a classroom situation. The teachers receive instruction on and detailed explanations of some of the difficult concepts they may have encountered in their studies. Second, group discussions are organized to provide an opportunity for the teachers to exchange views and experiences, and to consult with their supervisors and program administrators. Third, group meetings are held to provide teaching practice under supervision, and to conduct assessment in practical teaching as part of the final evaluation of the teachers. Fourth, written examinations are conducted at designated centers around the country, usually in teachers colleges or secondary schools.

All the residential sessions are held during the school holidays and involve a wide range of professional people. These include representatives from the Ministry's Inspectorate and the In-Service Course Unit, the Kenya Institute of Education, the Department of Distance Studies, the District and Divisional Education Offices, and the Kenya National Examinations Council.

From the institutional standpoint, the face-to-face component of the program has proved to be the most difficult to organize and execute, and certainly the most demanding in terms of staff time than the correspondence or radio components. It is also the one component that has invariably suffered from budget cuts, and the consequent understaffing and curtailed support services. It has also drawn the largest number of criticisms from the enrolled teachers. Apparently policymakers have yet to be



convinced that distance education, despite its name, does require systematic support services if the learners are to reap the maximum benefit.

### **Some Lessons Learnt**

During its existence, the Kenyan program of teacher training through distance education has learnt a number of lessons that can be summarized in the following eight points.

1. *Teacher effectiveness.* An effective teacher training program should include a fair amount of teaching of the subject matter that the teacher is supposed to teach, as well as an appropriate repertoire of pedagogical skills in the particular subject. The ideal balance between the academic and the pedagogical content has been a matter of persistent discussion and contention, but the general consensus is that both are important ingredients for teacher effectiveness.

2. *Motivation.* Although the teachers in the Kenyan program are generally highly motivated by the monetary benefits that follow their enhanced qualifications and status, their motivation needs to be sustained. In this respect strengthened supervision and professional support should be extended to the teachers to sustain their motivation and increase their professional commitment.

3. *Cost-effectiveness.* Distance education methods are not necessarily cheaper than conventional methods of teacher training, but for the specific needs of unqualified or underqualified teachers, particularly those in rural areas, distance education is the most cost-effective method available. It may also have other broad social and economic benefits for the country or region, for example, retaining dedicated but underqualified teachers in the profession or supporting qualified teachers by giving them extra work as tutors. One thing, however, is clear: the opportunity cost of distance education is significantly lower than for the more conventional teacher training programs.

4. *Economies of scale.* Economies of scale can be realized in distance education if the numbers are sufficiently large for one particular program, or if several programs can share administration, production, delivery, and regional support services. In Kenya, for example, the experiences gained in the use of distance education methods for training primary teachers have been used to train adult literacy teachers (at certificate level) and secondary teachers (at degree level).

5. *Cooperation.* Close consultation and cooperation among the various departments, organizations, and institutions involved in teacher education programs and clear definition of each entity's responsibilities are very important. However, this takes a great deal of time and effort, and often results in long delays in reaching final decisions. For example, in Kenya the issue regarding teachers certification and awards took more than two years to resolve. The final decision was that the Kenya Institute of Education would develop and review the teacher training curriculum, the Department of Distance Studies would conduct the distance teaching component, the Educational Media Service would prepare the radio programs, the Voice of Kenya would broadcast them, the Ministry's Inspectorate and Field Staff would supervise teaching practice, the Kenya National Examinations Council would conduct the final examinations and award certificates, while the Teachers Service Commission would recognize the certificates for purposes of employment and promotion.

6. *Training the distance educators.* Distance education requires teams of people performing different tasks and working at different levels to accomplish a common institutional goal. They all require orientation and training to equip them with the knowledge, skills, attitudes and approaches that are appropriate to distance education.

7. *Resources.* The central distance education institution must be adequately provided with the necessary physical, fiscal, and human resources to enable it operate efficiently.

8. *Political support.* The whole program must have strong political support and commitment.

### **Looking Ahead**

As developing countries continue to grapple with the problems of quantitative expansion of education for all people, the qualitative improvement of education at all levels, and the contingent issue of the cost of education, they must seriously consider alternative delivery systems. In this quest, distance education should play new and expanded roles. A distance education system that may have started as a stop-gap measure and then developed as an alternative system may become an integral part of the mainstream education delivery system. It may just be a matter of time.

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# 10

## APPLICATION AND COST-EFFECTIVENESS OF DISTANCE EDUCATION IN TEACHER PREPARATION: A CASE STUDY OF TANZANIA

*Egino M. Chale*

Tanzania is one of the member countries of the Southern Africa Development Coordination Conference. The country shares borders with Uganda and Kenya in the north, Mozambique in the south, Malawi and Zambia in the southwest, Burundi, Rwanda, and Zaire in the west, and the Indian Ocean lies to the east. The country represents the union of the former British colony of Tanganyika and the islands of the Sultanate of Zanzibar. Since its founding in 1964, Tanzania has made great efforts to unify the many different tribes that make up the population. One of the key instruments used to do this has been Kiswahili, the official language. English has the status of a co-official language, but its use is limited to the educated elite.

The country covers an area of about 245,000 square kilometers and has an estimated population of 23.2 million (1988 census), with an average annual growth rate of 2.8 percent. By 1977, about 80 percent of the population lived in planned villages compared to fewer than 5 percent at independence. Settling people in the villages was a deliberate government effort aimed at ensuring that people lived together so that they could be provided with basic services. Thus, Tanzania is largely an agricultural country: about 85 percent of its active population is engaged in agriculture and agriculture-related enterprises.

As in a number of other Sub-Saharan countries, the predominantly agricultural economy has not sustained the per capita income, which has been falling in real terms (World Bank 1988). The decline is attributed to a host of factors, such as unreliable and unpredictable climatic conditions and the downward trend of world prices of primary products relative to those of manufactured goods. Although Tanzania's economy has improved markedly in recent years following the adoption of the Economic Recovery Programme, the liberalization of trade, and the devaluation of the currency, the country remains one of the poorest in the world, its development hampered by a chronic shortage of foreign exchange.

The Tanzanian government views education as one of the most important instruments for development. This was reflected in government recurrent expenditure on education as a share of total government expenditure of 20 to 24 percent during the 1960s (UNESCO 1983), which was more than average for Africa. However, with the economic crises of the late 1970s and the 1980s, government recurrent expenditure on education has

constantly decreased relative to total recurrent expenditure (Anderson and Rosengart 1987).

Despite declining government recurrent expenditure, Tanzania had made significant achievements during the past decade: over 90.0 percent of the adult population is literate, while gross enrollment for primary school children was 80.5 percent. These achievements are to a large extent due to the national campaigns for universal primary education (UPE) and the eradication of adult illiteracy. Note, however, that since 1984 enrollment in primary education has gone down in relative and absolute terms. To redress this situation, the Tanzanian government has adopted an Economic and Social Action Programme. The government also recognizes that the country cannot attain sustained economic growth without rehabilitation of the social sector, particularly in the delivery of health and education services.

The move towards UPE in Tanzania was due to a number of factors. Both the high priority given to education by the political leadership as a means to transform Tanzanian society and the ensuing general mobilization to achieve the country's social and economic goals were decisive (Mählick and Temu 1989). Nevertheless, educational development faced a major challenge in the form of both the human and material resources that were required. Among the obstacles were the lack of classrooms, textbooks, stationery, and teachers' houses. However, one of the most serious problems was teacher preparation.

The officials responsible for the UPE program soon found that the conventional, residential teachers colleges could not help solve the teacher supply problem. Training enough teachers in this way would take too long and cost too much. Thus, the Ministry of Education introduced a large-scale distance training scheme in addition to conventional training at the teachers colleges. By the end of the UPE period, the number of distance-trained teachers was four times as many as their colleagues trained through traditional methods. However, after some time various observers, including parents, began to question the quality of the distance-trained teachers. They argued that this new approach, characterized by a combination of on-the-job training and studies at a distance (correspondence courses and radio broadcasts) could not compete with the training offered at the teachers training colleges. This debate on the effectiveness, and by that token the prestige, of the two programs dragged on for some time due to a lack of empirical evidence.

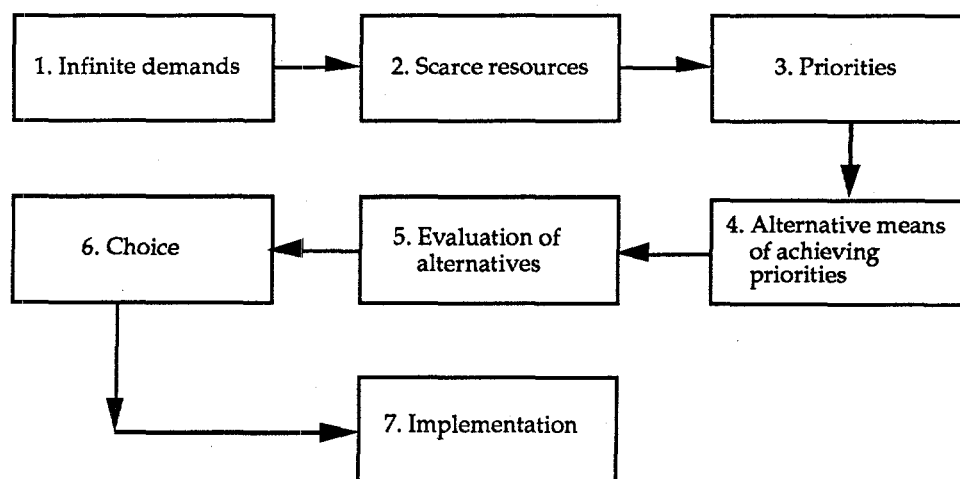
While the debate was going on, two studies emerged with very positive reports about Tanzania's experience with training teachers by distance teaching. Galabwa (1979) and Chale (1983) found that distance education was as effective as, and in some respects better than, the conventional approach to training teachers. Later another study conducted by an independent team sponsored by the Ministry of Education (Mählick and Temu 1989) confirmed these findings. Their results show no significant difference in most aspects of teacher training, but in the teaching of science, college-trained teachers performed better than distance-trained teachers. This is understandable, as those trained at a distance did not have access to laboratories. However, in the acquisition of classroom behavior, those trained by distance teaching surpassed college-trained teachers. The study concludes that distance education is a viable alternative to conventional training at teacher training colleges in terms of its cost-effectiveness.

## Alternative Approaches and Economic Analysis

In recent years, cost analysis has been at the heart of a number of educational programs (Jamison, Klees, and Wells 1978; Laidlaw and Layard 1974). The assumption is that education costs money, and is therefore an economic issue. However, as economics is about resources, which are often scarce in relation to the demand for them, decisions must be taken about how to allocate the resources that are available. Such decisions imply the establishment of priorities and choices, which are especially critical when alternative approaches can be used to achieve the same objectives.

To make rational choices from among alternatives, studies in program effectiveness need to be related to economic analysis. To illustrate the decisionmaking processes on an economic basis, Mace (1982, p. 92) provides us with the following logical structure (figure 10.1). Knowing how much each alternative costs is crucial.

Figure 10.1 Logical Structure: Decisionmaking Processes



In economic circles, money is presumed to represent the measure of the real resources used in programs. It stands for items like labor, buildings, and equipment. To calculate the cost-effectiveness of any project, educational economists have tended to use three main sources: a scrutiny of institutional budgets; the records of expenditures; and the value of the institutions, for instance, their buildings and equipment. In addition, however, they are also concerned about the projects' opportunity costs and hidden costs. Underlying the cost comparisons is the issue of what should be done, for instance, if an alternative approach is twice as effective as the old approach, but costs five times as much? In such a case, justifying the innovative alternative is likely to prove difficult.

## Methods of Cost Analysis and Annualizing

To understand why and how the costs of programs can vary, economists use defined cost analysis methodology (Mace 1982; Perraton 1982). This needs to be examined before

turning to the cost analysis of the programs discussed in this paper. In most studies (see, for example, Jamison, Klees, and Wells 1978; UNESCO 1977), cost analysis goes through four stages:

1. Finding all the costs;
2. Separating the running costs from the capital costs and annualizing the latter;
3. Identifying the fixed and variable costs;
4. Calculating a cost function relating costs to an education measure, such as the number of students or the number of courses.

The precise way in which the input cost of an educational output changes is described is a cost function. The simplest form of cost function should indicate that the total cost of educational output for a number of students ( $S$ ) depends on ( $S$ ), or in mathematical terms,

$$TC(S) = f(S)$$

where  $TC$  = total cost,  $S$  = the number of students, and  $f$  = a function of.

However, to determine how  $TC$  can vary with  $S$ , costs must be broken down into two types: fixed costs (those that do not vary with student numbers, for example, buildings), and variable costs (those that change as students numbers change, for instance, number of exercise books). This again may be represented mathematically:

$$TC(S) = F + V \cdot S$$

where  $F$  = fixed costs and  $V$  = variable costs.

This expression enables one not only to calculate total costs, but also the average cost per student and the incremental or marginal cost of having one additional student. The average cost per student is found by dividing fixed costs by  $S$  and adding variable costs, that is:

$$AC(S) = \frac{F}{S} + V$$

where  $AC$  = average cost. The marginal cost, the extra cost of an additional student, is given by  $V$ .

One other factor that must be taken into account in the cost analysis is annualization. This is because many educational projects have a life longer than one year, and much of the capital spending (fixed costs) may endure for longer than the project's life. In such cases it seems reasonable that the costs incurred should be spread over the life of the investment. For example, if the buildings constructed as part of a project have a life of twenty-five years, the cost of those buildings should be spread over that period. This is called the depreciation cost (see, for example, Perraton 1982).

However, annualization cannot be calculated simply by dividing the cost by twenty-five years because the funds used for the investment could have been used in other ways. For example, they could be invested in bonds and yield 10 percent interest per year. For this reason one must first take into account a social discount factor that represents a foregone return, then the depreciation costs, and finally the falling value of the capital tied up. Perraton (1982) points out that most recent studies have used a discount rate of

7.5 percent or 10.0 percent. To take account of the changing value of the capital invested over the life of a project, the initial cost has therefore to be annualized.

The formula most often used for calculating the annualization factor is one given by Jamison, Klees, and Wells (1978, pp. 32-33), Mace (1982, p. 92), and also discussed by Perraton (1982, p. 58). This is expressed as

$$a(r,n) = \frac{r(1+r)^n}{(1+r)^n - 1}$$

where  $a(r,n)$  = the annualizing factor,  $n$  = the lifetime of capital in years, and  $r$  = the prevailing interest rate or discount rate. Once  $r$  and  $n$  are known, all that needs to be done to determine the annualizing factor is to consult a set of financial tables. The cost of the program is then multiplied by the annualizing factor to give the annual cost of a program.

Yet another significant issue in the economic analysis of a project is its opportunity cost. The problem is to establish the value of the time people spend on their studies that they would otherwise spend doing something else. According to several studies (Perraton 1982), economists have not examined this issue very much.

Hidden costs for the two educational systems tend to be different. With regard to this study, the teachers training college system must, for instance, take into account the trainees' own contribution in terms of their production activities, not only within their families, but what they would be paid if they were employed as untrained teachers while studying.

### Cost-Effectiveness of the Teachers Training College

The costs of both the teachers training college (TTC) system and the teachers training through distance education (TTD) will be examined over a four-year period. The economic analysis of the three batches of college-trained teachers first examines the TTC system's running costs, then its capital costs with the latter annualized. Finally, it examines its additional hidden costs.

Tanzania provides four levels of teacher training courses in the TTCs: Grade IIIC, Grade IIIA, Diploma, and INSET. The resources used to provide these courses are inextricably intertwined, thus, it seemed pragmatic to work out the cost-effectiveness of the Grade IIIC TTC project on the basis of the Ministry of Education's unit cost per trainee in general.

#### *Recurrent Expenditure for the TTC System*

The annual unit cost per college-based trainee since 1976 has been estimated by the Department of Teacher Education in the Ministry of National Education at T Sh17,000. (This figure should be treated with caution. It may be exaggerated.) This figure has remained unrevised. This affirms that in real terms, the government's capacity to spend on teacher training has not been keeping pace with inflation.

Table 10.1 shows the number of successful trainees drawn from the three trained batches of trainees. The costs include expenditures on personal emoluments, boarding,

textbooks, and medical care (table 10.2). Note that only the last batch of trainees (C) went through a three-year training course.

**Table 10.1 Trainee Batches and Successful TTC Students, 1976/77 - 1980/81**

<i>Year</i>	<i>Batches of trainees</i>	<i>Number of successful trainees</i>
1976/77	A	—
1977/78	A + B	3,130
1978/79	B + C	2,277
1979/80	C	—
1980/81	C	3,245
<b>Total</b>		<b>8,652</b>

*Source:* Ministry of National Education, Department of Teacher Education.

**Table 10.2 Variable Costs per Trainee per Year**

<i>Cost item</i>	<i>Total cost (T Sh thousands)</i>	<i>Unit cost per year</i>
Personal emoluments	17,355	6,500
Traveling	679	452
Library, school equipment, materials, laboratory equipment	446	167
Pre-service training allowance	1,922	720
Transport of trainees	4,392	1,645
Teaching practice	— a	— a
Catering expenses	20,842	7,806
Hospital charges	71	27
<b>Total</b>	<b>45,708</b>	<b>17,119</b>

*Note:* Costs were calculated based on 2,670 trainees per year

a. Trainees did not receive an allowance for teaching practice.

*Source:* Ministry of National Education, Department of Teacher Education.

The above costs have been calculated based on 2,670 trainees per year. The gross annual variable costs need therefore to be multiplied by the total number of trainees within the five-year cycle.



The costs used here are based on Ministry of Education data (1980) and were confirmed by a UNESCO study for the Ministry of National Education (1981). Having examined the breakdown of the recurrent expenditures of the whole TTC project, the UNESCO (1981) document laments: "Taking all colleges together approximately half the non-salary expenditure is accounted for by catering expenses and about one quarter by training allowances." Note that over the five-year cycle, no budget was allocated for the trainees' teaching practice.

### *Capital and Fixed Costs of the TTC System*

Determining the capital and fixed costs of all thirty-five teacher training colleges would be difficult. Thus, we will estimate the capital costs of a typical teachers college.

According to UNESCO (1981), a new teachers college for up to 600 students per year is likely to cost of T Sh59 million (US\$7 million). This will cover the costs of boarding facilities (29 percent of total costs), tutors' houses (50 percent), and equipment (10 percent). The remaining 1 percent is for miscellaneous expenditures. If the country were to stick to an annual average of 2,670 trainees, it would need five such colleges.

However, as the capital expenditure of the T Sh59 million would last for more than the five-year period under consideration, the capital fixed costs need to be spread over the life of the investment. If the new college were constructed during the period under consideration, the buildings would have a life expectancy of fifty years, the equipment of ten years. To find out the annual cost for a single college, the project's capital cost needs to be multiplied by its annualizing factor calculated using a social discount rate of 7.5 percent. As this would be the annual cost of a single college, it needs to be multiplied by five colleges and over the five-year period. This is shown in table 10.3 along with other fixed costs.

**Table 10.3 Breakdown of Fixed Costs for a Typical College**

<i>Itemized inputs/ components</i>	<i>Life expectancy (years)</i>	<i>Capital cost (T Sh thousands)</i>	<i>Annualization factor using interest rate of 7.5%</i>	<i>Annual cost (T Sh thousands)</i>
TTC buildings	50	53,100	0.077	4,088
Equipment	10	5,900	0.146	861
Office expenditures	1	—	—	491
Maintenance of buildings and grounds	1	—	—	561
Maintenance and running of vehicles and machinery	1	—	—	710
<b>Totals</b>		<b>59,000</b>		<b>6,711</b>

— = no capital cost involved

*Total Costs of the TTC System*

In light of the analysis we may conclude that annual variable costs per trainee are T Sh17,119 (table 10.2) and annual fixed costs for a college of 600 trainees are T Sh6,712,000. Then according to the equation

$$AC(S) = \frac{F}{T} + V, AC(S) = \frac{6,712,000}{600} + 17,119 \text{ or T Sh28,305 per year}$$

Therefore the cost per trainee was T Sh56,610 ( $28,305 \times 2$ ) for those who trained for two years, and T Sh84,915 ( $28,305 \times 3$ ) for those who trained for three years. The total cost (TC) per year was  $F + V \cdot S = \text{T Sh52,419,305}$ .

*Hidden Costs of the TTC System*

In addition to the analyzed costs, hidden costs need to be taken into account. First is the parents' contribution to the trainees' up-keep, second is the trainees' own contribution in terms of their production activities.

On coming to a college the trainees are normally required to bring with them a number of items, including uniforms, bedding, shoes, worktools, and stationery. Trainees' parents are expected to pay for these items at an estimated total cost of T Sh1,150 per trainee per year (the figure was arrived at using prevailing retail prices). As parents pay for these items, their cost could be considered a savings on the part of the government in terms of its recurrent public expenditure.

Yet the ability of the government and of parents to finance teacher training is limited. As a result the trainees are expected to shoulder some of the burden of their running costs. The government's policy provides that every college should meet 25 percent of its recurrent expenditure through its own activities, which must be shown on its books, for example, income from sale of a named cash or food crop, sales from a poultry or piggery project, value of food grown and consumed, value of labor done by the trainees on a new building, and repairs of equipment.

Despite this policy, a national evaluation (MNE 1980, p. 23) indicated that on average, the colleges have not been able to contribute more than 7.2 percent per year to their running costs. Thus if we deduct the value of what colleges produce, that is, 7.2 percent of the unit cost of T Sh17,119, we get T Sh15,886 per person.

Thus if we take the annual cost (AC) for a successful trainee of T Sh28,305, add the parents' contribution of T Sh1,150, and reduce this by the value of the trainees' production activities (7.2 percent), this gives us T Sh27,334 per person per year.

**Cost-Effectiveness of the TTD System**

Except for the trainees' pre-service allowance, unlike the TTC system, the TTD system was not directly financed by the Tanzanian government. Instead, it came to be largely financed by foreign grants, notably from the Swedish International Development Agency, UNESCO, UNICEF, and the Ford Foundation.

The project's economic costs as analyzed below are consequently drawn from accounts given by both the Ministry of National Education's Department of Teacher Education (MNE/DTE) and the Institute of Adult Education's National Correspondence Institute (IAE/NCI), which coordinated the project's activities. Despite the emphasis on reduced budgets, its conception and plan of operation was not accompanied by any precosting element. Thus, had it not been for the availability of audited accounts, the costs of the TTD system would have been as inextricably intertwined as was the case for the TTC system.

#### *Recurrent Expenditure of the TTD System*

Table 10.4 summarizes the number of successful trainees drawn from the three batches of trainee Grade IIIC teachers.

**Table 10.4** Trainee Batches and Successful TTD Students, 1976/77 - 1980/81

<i>Year</i>	<i>Batches of trainees</i>	<i>Number of successful trainees</i>
1976/77	A	
1977/78	A + B	
1978/79	A + B + C	12,470
1979/80	B + C	10,050
1980/81	C	12,553
<b>Total</b>		<b>35,028</b>

*Source:* Summarized from analysis, Ministry of National Education data, and Institute of Adult Education data.

The costs were spread across handling of the study material by administrative and clerical staff at the MNE/DTE and IAE/NCI headquarters, postal services, pre-service allowance to the trainees, field visits to the training center, monitoring of the project, and evaluation of its inputs and activities. These costs are broken down in table 10.5. The item that accounts for a proportionately large variable cost is the trainees' pre-service allowance of T Sh150 per month each. This amount, which remained the same throughout the five-year cycle, needs to be multiplied by twelve months to get the annual unit cost. Note that TTC students received only T Sh60 per month.

**Table 10.5** Variable Costs per TTD Trainee per Year

<i>Cost item</i>	<i>Total cost (T Sh thousands)</i>	<i>Unit cost per year (T Sh)</i>
Paper and printing	9,420	628
Administrative and clerical work and distribution of study materials	4,500	300
Postal services	3,015	201
Monitoring of the project through visits to the local teachers centers, including research and evaluation	2,700	180
Pre-service allowance	27,000	1,800
Six-week residential seminar in a teachers college and transport	5,160	344
Three required academic subject courses of secondary equivalent	2,940	196
<b>Total</b>	<b>54,735</b>	<b>3,649</b>

*Note:* Based on an annual intake of 15,000 trainees.

*Source:* Audited accounts.

### *Capital Costs of the TTD System*

Table 10.6 summarizes the TTD system's capital and fixed costs. They include the costs of the centrally-based professional and administrative staff, both at the MNE/DTE and IAE/NCI, buildings, plant and equipment, preparation of the study courses and radio programs, maintenance of equipment and vehicles, and orientation seminars for all personnel involved. Note, however, that some of the capital assets were in place long before the TTD system started, as was the case for the TTCs, and their value has been amortized. Distance teaching activities that had been housed in the IAE building, for instance, moved into the new National Correspondence Institute premises just as the TTD system took off in 1975. On its completion, the building was valued at T Sh14 million. If we add 30 percent to the building's value to allow for annual inflation rates, its present value may be estimated at T Sh29 million. This would be its true value if it were constructed as part of the TTD system. The building was planned to accommodate 35,000 students a year. Here, its economic analysis has to be calculated using the actual annual intake of 15,000 trainees.

Table 10.6 Breakdown of the TTD System's Fixed Costs

<i>Itemized inputs/components</i>	<i>Life expectancy (years)</i>	<i>Total capital cost (T Sh thousands)</i>	<i>Annualization factor (r=7.5%)</i>	<i>Annual cost (T Sh thousands)</i>
National Correspondence Institute buildings	50	29,200	0.077	2,248.4
Printing machinery, storage, and recording equipment	15	6,000	0.113	678.8
Professional and executive staff at head offices	-	3,020	-	604.0
<i>Vehicles and equipment</i>				
46 landrovers	7	4,378	0.189	87.74
350 motorcycles	7	2,466	0.189	46.61
208 bicycles	7	1,544	0.189	29.17
1,955 radios	6	1,046	0.213	22.28
2,400 cassette players	6	3,600	0.213	76.68
Maintenance of vehicles and other equipment through mobile units	-	4,500	-	900.0
Workshop on coursewriting production	5	21	0.247	5.2
Workshop on script preparation for radio programs	5	17	0.247	4.1
Radio transmissions	-	750	-	150.0
Orientation seminars	5	14,600	0.247	3,614.6
<i>Books</i>				
Locally printed books, including syllabus, analysis	8	300	0.171	51.0
Other	8	1,000	0.171	171.0
<b>Total</b>		<b>72,475</b>		<b>8,689.9</b>

- = not applicable

Fixed costs for the training centers are considered as additional costs and are discussed later. The same applies to the fixed costs for residential training during the six-week college-based seminar.

Further, the costs of course production workshops, seminars, radio transmissions, and textbooks are considered fixed because these remain the same irrespective of the number of trainees. In particular, they were related to the training centers, whose numbers remained fixed throughout the five-year cycle.

*Total Costs of the TTD System*

Based on the analysis, we can conclude that the annual variable cost (table 10.5) is T Sh3,649 and the total annual fixed costs for the intake of 15,000 trainees is T Sh8,689,864, or T Sh579 per trainee. Then using the equation

$$AC(S) \text{ a year} = \frac{F}{S} + V, \quad AC(S) = \frac{8,689,864}{15,000} + 3,469 \text{ or T Sh4,229 per year}$$

Thus, the cost per successful TTD trainee was T Sh4,229  $\times$  3 (to cover the three-year training period) or T Sh12,667. The total cost TC(S) per year was

$$\begin{aligned} F + V(S) &= 8,689,900 + 3,649 \times 15,000 \\ &= 8,689,900 + 54,735,000 \\ &= \text{T Sh63,424,900} \end{aligned}$$

*Hidden Costs of the TTD System*

The TTD system appears to have five main hidden costs. The first stems from the apprenticeship pattern of the project. If the government had employed the trainees as full-time untrained teachers, every trainee would have been paid T Sh480 per month (the minimum wage). Instead, for nine months a year, the trainees took on half of the teaching workload, but received only T Sh150 per month as a pre-service allowance rather than T Sh240 a month. That is, each trainee was paid T Sh90 less a month, or T Sh810 less per year, or T Sh2,430 less over three years. The figure was therefore a savings for the government.

The second hidden cost is due to the project taking advantage of existing staff—including regional and district education officers, college principals, and divisional and ward adult education coordinators—for the project's training and supervision objectives. All of them worked extra hours to support the project by attending seminars and making field visits to the teachers centers. Of all those involved, the role of the ward coordinators as local tutors of the teachers centers needs to be accounted for in a special way. They spent not less than fifteen hours a week on this activity. If they were to be paid at the same rate as part-time IAE evening class staff, each coordinator would have been paid T Sh35 an hour by the government. This would cover the costs of direct tuition, marking workbooks and assignments, keeping training records, and supervising trainees' classroom teaching. Given 2,000 coordinators working fifteen hours a week each, this would have cost the government T Sh1,050,000 a week. With a school year of nine months (thirty-six weeks), the recurrent expenditure would have risen to T Sh37,800,000. The cost would, however, need to be spread across the annual intake of 15,000 trainees, which would put the cost at T Sh2,520 per year.

The third hidden cost is the monetary value of the training centers' premises. As the case is with the TTC, this cannot be taken for granted. Throughout the period, a center should have received a monthly rent of T Sh50 (as determined by the National Price Commission), thus the public recurrent expenditure per trainee would have been T Sh7 per month, or T Sh84 per year.

The fourth hidden (fixed) cost pertains to the trainees' stay in a residential college for the six-week seminar. Spread across the three-year training period, the six weeks amounts to one twenty-fourth of the time spent in college by a full-time college trainee. If the value of this time is seen against the AC(S) of the TTC project, it amounts to T Sh1,179 per TTD trainee per year (that is one twenty-fourth of T Sh28,305).

Finally, as this was a nonresidential project, this enabled the government to save money that would otherwise be spent on board and lodgings for the trainees. As discussed in relation to the TTC system, the two items constitute a large proportion of the residential recurrent budget. Since 1976 the government has been spending an average of T Sh12.50 a day per trainee on board and lodgings (Report of the Presidential Commission on Education 1982). Given 230 days per academic year, the government's variable cost would have been T Sh2,875 per trainee. For the home-based trainees, however, this cost could be said to have been borne by their parents.

Table 10.7 summarizes the overt and hidden costs of the TTD project.

Table 10.7 Summary of Costs per TTD Trainee per year

<i>Type of unit cost</i>	<i>Unit costs per year (T Sh)</i>
Variable costs	3,649
Fixed costs	579
<i>Hidden costs</i>	
Ward coordinators at teachers centers	3,520
Premises of the teachers centers	84
Premises of the TTC	1,179
Less value to government of teaching in schools by trainees	810
Net cost per TTD trainee	7,201

Thus, the total net cost per TTD trainee is T Sh7,201 x 3 (years), or T Sh21,603.

### Comparing the TTC and TTD Projects

Having analyzed both the overt and hidden costs of the two teacher training programs, we observe that the net unit cost for the three-year TTC trainee was T Sh82,002, while the net unit cost for a three-year TTD trainee was T Sh21,603. The latter was therefore one quarter of the cost. This was largely because of the TTD system's hidden costs. The trainees' on-the-job teaching experience enabled the government to save a lot of money.

However, we must emphasize that the conclusion is based on the analysis of the annual costs per trainee. The analyses were beset with two kinds of problems. On the

one hand, the specific data needed were intertwined with other data as explained. On the other hand, it was difficult to iron out the effects of inflation prevailing in Tanzania in a number of budget items. One may wonder, for instance, that the trainees' allowances remained the same from 1974 to 1983.

Thus despite strong arguments for looking at costs over a period of years, several similar studies have found it equally hard and have been unable to do so (Jamison, Klees, and Wells 1978, p. 35). In addition, the costs have not been converted to constant currency through the use of the Tanzanian consumer price index over the study period. Therefore this analysis gives us an accurate picture not over the cycle considered, but on annual relative costs per trainee. As Perraton (1982, p. 59) comments: "Often, an economic analysis is like a still photograph: it looks at an institution at the time the study was made. It may catch a good likeness, or it may be distorted."

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# Part IV

## SUMMARY AND CONCLUSIONS



## DISTANCE EDUCATION: THE WAY FORWARD

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and  
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Education in Sub-Saharan Africa is giving cause for concern. Both external observers and those directly involved believe that its quality is declining (Williams 1986; World Bank 1988). Two of the most important factors affecting the decline in quality in the 1980s were the reduction in the resources allocated to formal education and the dramatic and continuing population increase. The cumulative effect was to deny an increasing number of children access to education, while reducing the quality of education for those who did gain access. Yet education is fundamental to the region's economic, cultural, and social development.

Most of the region's governments are concentrating their efforts on primary education and, within this sector, the challenge is to assist increasing numbers of children with declining resources for each pupil. Alternative, less costly, but equally effective methods are required to produce capable teachers, to provide more relevant classroom materials, to help school principals administer schools, to provide a relevant curriculum, and to monitor and maintain quality. The concentration on primary education is increasing the social demand for second-level education, and the developing economies require more people educated at this level. However, the number of eligible students that obtain a place at secondary school is small, and the vast majority of children, in particular the girls, do not have the opportunity to get a second-level education.

At a time of economic distress and strong demographic growth, what can governments do to increase access to education without increasing costs? How can they provide sufficient numbers of qualified and motivated teachers? Can distance education help to guarantee educational quality when resources are scarce?

### **The Potential and Use of Distance Education**

Perraton (chapter 2) confirms the potential of distance education. Projects at all levels of education and in many different countries provide evidence of the success of distance education to solve a wide range of educational problems. Perraton identifies four success factors:

- Costs must be lower than the conventional alternative;
- Students must be motivated;
- Good technical practice is needed;

- Adequate resources must be made available.

Unfortunately, these success factors are not in place in many Sub-Saharan African countries. Curran and Murphy's review (chapter 4) found that the final two factors were not in place in the six countries they examined. In regard to Perraton's first success factor, costs could apparently be lower than for the conventional alternative, but Curran and Murphy were unable to gather comparative data on the costs of successful learners. Finally, their review does not directly confirm or deny the value of student motivation. On the one hand, student motivation is likely to be a factor in the success of the programs training teachers and in the failure (at least in terms of examination success) of the programs to help adults get a second-chance education. On the other hand, the level of face-to-face support provided may well have a bearing on success. For teachers, residential courses are provided, for second-chance learners very little face-to-face support is given.

## **Second-Level Education**

Three papers looked at the record of distance education in providing a second-level education. Perraton (chapter 5) reviewed worldwide experience and identified three models. The first, providing education outside school to individuals, has an "inglorious" history in Africa and "the sad evidence is that few independent students working at home and without support from a study center succeed in studying at a distance." Curran and Murphy (chapter 3) confirmed this view. Perraton's third model, improving the quality of education in schools, is effective, but its cost must be added to the already high costs of providing regular second-level education in schools. As such, in the current difficult economic circumstances of many African countries, its application is likely to be limited.

Perraton's second model is providing education to groups in study centers. This model has potential. Murphy's examination of the effectiveness of the study center systems in Malawi, Zambia, and Zimbabwe (chapter 6) concludes that these systems provide access to a second-level education for many who would not otherwise have access. In those countries for which data were available, he found that study center students perform better in examinations than other out-of-school students and that dropout rates are low. These positive achievements occur despite many problems: the systems' organization and management is weak, the instructional materials vary in quality, radio programs are not being received, and face-to-face support is not working as planned. The same author's examination of the costs of the study center system in Malawi (chapter 7) found that the cost of educating one student in the study center system was between one-fourth and one-fifth of the cost of a student in a day secondary school. The cost of producing a subject pass in the study center system also appeared to be less, and the cost of producing a full examination pass was less if more than 20 percent of the study center students passed the examination. In recent years, more than 40 percent have been passing. Given that study center students have not performed as well in the primary school leaving examination as secondary school students, these are extraordinary findings.

These chapters show that study center systems warrant investigation by countries with limited resources that want to increase access to second-level education. Murphy identifies three options: increase access to second-level education using study centers,

provide access to second-level education in rural areas using study centers, and provide the last two years of compulsory education only in study centers. Each of these options has its advantages and disadvantages; however, all are less costly than building, equipping, and staffing more second-level schools. If countries decide to use study center systems to provide education for more students, then they need to pay a great deal of attention to the organization and management of the systems and the instructional materials and the methods of distributing the materials and improve the effectiveness of the face-to-face instruction. While the costs for each student reached will be significantly lower than in schools, these improvements will require increased resources, which will need to be found within the overall allocation to the second-level sector.

## Teacher Education

Teacher education has also suffered from the decline in resource allocation, while the demand has increased because of the increasing numbers of students within and outside the primary schools. Here also distance education has proved very effective, and by the mid-1980s at least eighteen countries across Africa were using distance education to prepare teachers (Nielsen 1990).

The examination results achieved on some distance education programs for teachers are very encouraging. Perraton (chapter 2), showed pass rates in excess of 80 percent for the four projects for which data were available. Curran and Murphy (chapter 4) report that 88 percent of a group studying at a distance in Kenya passed the examination, compared to 85 percent of those studying in teachers colleges. They also report pass rates of 87 percent in Lesotho, while Chivore (chapter 8) shows pass rates for the ZINTEC program that compare favorably with the conventional alternative. Of more importance than examination pass rates is effectiveness as teachers. Chivore (chapter 8) and Chale (chapter 10) report on studies comparing the effectiveness of teachers trained using distance education and teachers trained conventionally. In Zimbabwe, a study found that student teachers in the ZINTEC program were as effective as student teachers in conventional programs, while a pilot study of teachers in the field found that ZINTEC-trained teachers were more effective than those who had trained conventionally. In Tanzania, two studies found little difference between the effectiveness of teachers trained using distance education and those trained conventionally.

Educating teachers often involves post-secondary courses and a mixture of academic and pedagogical goals: teachers must learn both the subject matter of the relevant discipline and teaching and learning strategies. Because of its relative complexity and the importance attached to the teaching profession by many countries, teacher education may involve universities, parastatals, and ministries of education working together. Kinyanjui (chapter 9) describes the organizational elements of the distance education program for teachers in Kenya. These include self-instructional materials, mainly print with some radio, residential courses in teachers' colleges, and ongoing supervision. The student teachers study the self-instructional materials as they teach in schools. These elements are broadly similar to those reported for Zimbabwe and Tanzania. However, the relative weight of each element differs from country to country. In Zimbabwe, for example, the residential courses take up a longer period of time than in Tanzania or Kenya. The lessons learned in Kenya and described by Kinyanjui have relevance for

many countries. These are that a balance is needed between academic and pedagogical content; that student teachers' motivation should be sustained; that distance education can be less costly than the conventional alternative if certain criteria are met, particularly in regard to economies of scale; that the different organizations involved in providing the course must cooperate; that adequate resources should be supplied; and that the distance education effort requires strong political support.

While no cost data are available for the recent Kenyan program or for ZINTEC, Chale's study in Tanzania (chapter 10) found that each teacher trained by the distance education program cost one quarter of the cost of each teacher trained conventionally. Chale observed that the trainees on-the-job teaching experience enabled the government to save a good deal of money. While Chale's findings on cost are strictly applicable only in Tanzania, evidence from other studies both in Africa and elsewhere indicates that the costs of teachers trained using distance education are likely to be less than the costs of conventional teacher education, provided that the numbers are sufficient (Dock, Duncan, and Kotalawala 1988; Hawkrigde and others 1982).

Thus, programs that train teachers using distance education apparently produce teachers who are as effective in the classroom and who cost less per trained teacher than the conventional alternative. These findings must have relevance for countries considering how to make scarce educational resources go further. One can envisage all of a country's teachers being produced through distance education, with existing teachers' colleges and staff providing the residential course element. The savings can then be used for other educational needs.

### **Parity of Esteem**

Given some positive experiences of using distance education in Africa to solve a variety of educational problems, the relative effectiveness of the study center systems in three countries to increase access to second-level education and its cost-effectiveness in one, and the many positive experiences of using distance education to produce teachers, why is distance education not being used more in Africa? Why, in particular, are countries not training all their teachers using distance education? Why are countries not using study center systems more to provide access to second-level education for primary school leavers? Seeking the answers to these questions may now be more important than continuing to show that distance education works well in some circumstances. The answers are likely to assist those involved in distance education to offer a more acceptable learning package.

One answer was provided by Fay Chung, Minister of General Education in Zimbabwe (chapter 1), when she pointed out that distance education does not enjoy parity of esteem with conventional education. Apparently policymakers, education practitioners, and parents see distance education as a second-rate, second-best alternative. A good deal of work remains to be done to identify why this is so. We can point to eight factors that may contribute to these perceptions.

- Those who are guiding the educational destinies of young people in Africa are themselves products of the conventional school system. They may perceive their schooling as having helped them to achieve success, and they may assume that schools will do the same for their children.

- The Western countries with which many African countries have links provide most of their second-level education for young people and train most of their teachers in conventional schools and colleges. These conventional methods are seen as the optimum methods.
- The history of distance education in Africa has not been encouraging. In many countries correspondence colleges were established to provide a second-chance education for adults. Their relative lack of success and the demands of the formal system of education combined to drain resources away from these colleges. This in turn reduced their effectiveness further.
- Countries have not allocated sufficient resources to distance education. Distance education was often justified on narrow cost grounds, and cost savings were expected to manifest themselves immediately instead of being the result of significant early investment yielding cost benefits over time. The result was insufficient attention to the design of good instructional materials and strong administrative systems.
- In two cases for which distance education has great potential for Africa, providing a second-level education for primary school leavers and training teachers, the conventional systems have been in place for many years and employ large numbers of articulate people who naturally defend the conventional systems. Any new arrangements will require difficult decisions about these people and would require a good deal of political will.
- Resource difficulties are involved in providing some kinds of learning experiences in a distance education system, for example, acquiring practical skills and gaining laboratory experience. The technical problems of providing these experiences have been resolved. However, the resolution of the problems requires resources that may not be available.
- The educational experience provided in a distance education system may be perceived to be different from the experience provided in conventional schools and colleges. Carnoy and Levin (1975) argued that the Open University did not provide the same kind of learning experience as conventional universities in Britain. Access to libraries and interaction between students and between students and teachers/lecturers are usually less available in a distance education system than they are in schools and colleges. One can argue that this limits the educational experience provided by a distance education system.
- Distance education is often perceived as excluding face-to-face instruction. As such, many educators do not believe that it can help young people who need a supportive learning environment

The perception of distance education as second-rate is deep rooted and widespread in Africa. It affects each of the partners in education: governments, communities, and educators. Changing this perception will take time. The seminar participants suggested ten ways to achieve this.

1. Students in each system should be of equal ability and from similar backgrounds.
2. There should be student mobility between the two systems.
3. Quality should be monitored regularly in both systems.
4. The distance education system should have political support and commitment.

5. The distance education system should be provided with adequate resources, particularly in its initial stages.
6. The distance education system should have carefully designed institutional structures and some financial autonomy.
7. The distance education system should have a specific role and clear target groups.
8. The instructional materials used in distance education should be of high quality.
9. Distance education staff, particularly management and finance officers, should be provided with appropriate training.
10. The distance education system should have an internal research and evaluation unit with some independence from management.

Implementing these suggestions will certainly change perceptions. In addition, however, the proponents of distance education should consider how to incorporate the best practice from conventional schools and colleges in any distance education system.

### **Organizational Structures**

Distance education is relatively complex and is not widely understood. It involves developing, producing, and distributing self-instructional materials in addition to organizing face-to-face teaching, and often requires that a number of different institutions coordinate their work. It usually reaches across very large geographical areas, sometimes across borders. It has been called an industrialized form of education because it involves processes and activities more often found in industry than in education: deadlines must be met, production quotas achieved, and services provided efficiently to students. Thus, as Perraton points out (chapter 2), distance education "demands staff who combine educational and administrative skills in a different way from the ordinary teacher. Similarly, it demands new alliances: between educators and broadcasters, for example, and between those concerned with education in school and outside."

One of the seminar's working groups focused on two questions pertinent to organizational structures. First, what distance teaching institutions already exist? Second, what is the educational task to be performed?

In regard to the first question, Curran and Murphy (chapter 3) reported that five of the six countries studied had established special institutions for distance education, while the sixth, Zimbabwe, is planning to establish the Zimbabwe Institute for Distance Education. However, these institutions have limited autonomy, inadequate resources, and do not enjoy equal status with the traditional secondary schools.

The educational task being performed also imposes organizational requirements. Recent primary school leavers studying outside school may require supervisors to work directly with them, carefully structured learning materials and a marking service, support from the community, and help from the national radio service. All this support has to be organized by the distance teaching institution.

Courses for student teachers also involve the distance teaching institution providing well-designed learning materials and a marking/monitoring service. In addition, colleges of education will be involved for residential courses and credentialing and



ministry of education staff will be involve in the classroom supervision. For one institution to organize and deliver a range of educational materials and face-to-face support is sufficiently difficult without also having to coordinate the activities of other, perhaps more autonomous, institutions.

The participants were convinced of the importance of organizational structures, and the working group recommended establishing permanent national structures to organize in-service teacher training. The working group also recommended that distance education programs for teachers should take advantage of existing infrastructure.

For second-level education the participants recommended that organizations have autonomy with regard to staffing, finance, and decisionmaking. At the start-up stage, adequate resources should be provided and attention given to ensuring that the quality of the instructional materials is high and that the public is made aware of the importance and status of distance education. Staff also need appropriate training in the tasks expected of them.

## Seminar Recommendations

During the seminar's concluding sessions the participants made the following recommendations. Implementing these would support and extend good-quality distance education in Sub-Saharan Africa.

- *More and better intercountry cooperation is needed.* One suggestion to achieve this was to establish a major new institution to coordinate all the work being done in distance teaching in Africa along the lines of the suggested Center for African Distance Teaching, which was recommended in the World Bank's policy study on education in Sub-Saharan Africa. Other suggestions included strengthening the African Association for Distance Education and establishing a number of regional networks. The institution or networks would perform a number of functions, including helping to develop instructional materials in modular form that could easily be adapted for use in specific countries, to strengthen existing institutions offering distance education in Africa, to develop training courses for practitioners, and to provide external assessment and monitoring for institutions using distance teaching methods. Any institution or networks established would provide a focus for the involvement of donors and interested agencies, such as the Commonwealth of Learning or the International Council for Distance Education.

- *Existing institutions offering distance education should be strengthened.* The participants felt strongly that existing institutions needed help to provide a better service. This might be done through the cooperation arrangements already mentioned. Nevertheless, existing institutions need help to develop costed action plans that are focused on identified educational needs, planned staff development programs, and equipment requirements. Donor organizations and institutions would have an important role to play here.

- *Countries should be helped to develop new approaches.* For countries without a tradition of using distance education help might involve identifying opportunities and developing institutional structures and a plan. Institutions such as the World Bank, the Commonwealth of Learning, and UNESCO could assist in this way.

- *More research and evaluation exercises should be conducted.* Follow-up studies should be carried out in different countries to determine the effectiveness of the different distance teaching systems. In addition, basic research is needed to determine the factors that make systems effective, particularly those that combine distance teaching with traditional education.

- *Countries should be helped to develop project proposals.* A number of countries are planning to use distance education in new ways or to expand and revitalize their current systems. They need to develop proposals to donors to gain financial support, particularly for the initial stages of such projects.

- *Seminars should be held that focus on the uses of distance education for other levels of education.* The Harare seminar looked at second-level and teacher education, but distance teaching has the potential to provide education at all levels. Other seminars could examine the use of distance education at the tertiary level, at the primary level, and for nonformal education.

- *Continuing international recognition of the importance of distance education is needed.* The World Bank's policy study of education in Sub-Saharan Africa identified the importance of distance education. What is needed now is for it to be put on the agenda of the various ministerial meetings following up on this report and the establishment of a special working group. Another possible way to gain international recognition is for UNESCO to declare a distance education year.

- *Distance education practitioners should be supported.* Across Africa many people are involved in all facets of distance education, including management, financial analysis, design and production of instructional materials, administration, research, and evaluation. These practitioners need support, such as on-the-job training, meetings with fellow practitioners, and assistance to present their case to different ministries.

Africa today has considerable knowledge of and expertise in distance education. Many institutions have been providing distance education programs for more than twenty years. Despite this, their achievements tend to go unrecognized and they receive inadequate support for their efforts. Yet they have been succeeded in providing low-cost, effective teacher education and increasing access at low cost to a reasonable quality second-level education. Africa's population growth and resource constraints demand that their expertise be recognized and supported.

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