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ABSTRACT

This paper examines the relevance and cost-effectiveness of the use of mass media for spreading education and the dissemination of information needed to sustain growth and technological progress in developing countries. An overview of experiments with the use of radio and television for educational purposes provides brief descriptions of distance education projects in the USSR, the United Kingdom, Niger, Honduras, Rwanda, Nicaragua, the United States, India, Australia, and Malaysia, and notes related activities in other countries. Discussion of the economics of distance education focuses on issues raised by case studies on the cost-effectiveness of distance education in various countries. Prospects and issues in the field are then discussed in the context of: (1) primary and secondary education; (2) teacher education; (3) education management and administration; (4) tertiary education; and (5) nonformal education. A brief review of the Asian Development Bank's involvement in distance education concludes this paper. Sources of additional information on the projects described and the case studies cited are indicated in footnotes. (MES)

DISTANCE EDUCATION

PROFESSIONAL STAFF PAPER

March 1985

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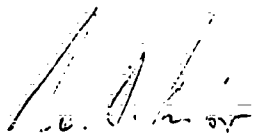
F O R E W O R D

Education is one of the important sectors in which the Bank provides assistance to its developing member countries. In view of the many advances and technological changes in education and the growing demand for adequate facilities, it is necessary to keep the strategy for development in this sector under constant review. Accordingly, it is proposed to publish occasional professional staff papers on selected subjects relating to education.

This Paper, the first in the series, deals with Distance Education and discusses some of the issues that merit the attention of educational planners. It is hoped that the paper will promote wider discussion and exchange of views on the subject.

The Paper is prepared by Mr.Motilal Sharma, an Education Specialist in the Bank. The author is grateful for the input from the staff from the Education Division and other departments in the Bank in the preparation of this Paper.

The views expressed in the Paper however do not necessarily reflect policy of the Bank.



W. D. KLUBER
Director

I. INTRODUCTION

1. One of the biggest obstacles to sustained growth and endogenous technological progress in developing countries is the lack of education. The conventional means of spreading education are proving to be inadequate in the face of growing populations. Although the proportion of adults in developing countries who are literate is estimated to have increased over the past three decades from about 30 per cent to more than 50 per cent, yet because of population growth, there has been an increase of about 100 million in the absolute number of illiterate adults since 1950. 1/ Furthermore, the quality of schooling remains low in many countries and, in particular, in remote rural areas where it is inevitably inferior to that in urban areas.

2. There has been a relatively heavy investment in education by developing countries. Their total expenditure on education rose in real terms (in 1976 dollars) from about $9 billion in 1960 (2.4 per cent of their collective GNP) to $38 billion in 1976 (4.0 per cent of their collective GNP) but school attendance in some parts of the world remains low, especially in rural areas. This is not simply because schools are unavailable, but because not every one who has an opportunity for education accepts it. 2/

3. Conventional methods of imparting instruction are now inadequate, with the school no longer the sole purveyor of knowledge and shaper of social attitudes. The mass communications media such as radio and television play a crucial role in the dissemination of knowledge. Radio has the advantages of wide reach, low cost and can be used even in unelectrified locations. Properly designed and supported radio projects have the potential for improving learning (and in certain cases, reducing costs). 3/ Television can also be an extremely powerful instrument for spreading education. Space technology, with the invention of the direct broadcast satellite (DBS), has made possible the reception of television programs even in very remote areas without setting up a television station, thereby reducing capital costs of such projects. DBS experiments have been carried out in a number of countries including Canada, Japan, India, the USSR and the United States; with USSR, Canada and India having operational DBS systems. 4/ More and more countries are considering how this system might be used for educational purposes.

4. There are several reasons for the increasing use of mass media in education. First, the educational systems in several Asian and

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1/ The World Bank, Poverty and Human Development, p. 3, 1980.
2/ Ibid, p. 14.
3/ Ibid, p. 21.
4/ United Nations General Assembly, Report on the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space, 1982.

Pacific countries are not suitable for meeting the challenge of economic growth which is primarily based on agricultural and rural development. Patterned each on the basis of its individual culture the educational systems in many of these countries are now undergoing a change with emphasis on the provision of practical knowledge to farmers and rural youth for the development of appropriate skills. In several countries, the technological expertise needed for rural transformation has not yet reached the rural people and in many cases extension workers lack training in the skills of teaching adults. This situation warrants incorporating the advances of communications technology into new techniques of teaching. Second, the human and financial resources available for education are limited in many countries. Traditional and institutional methods have proved inadequate to fulfill the growing needs of formal as well as non-formal education and now, for the first time, mass media can provide the means to offer education in selected fields to large numbers of people without incurring huge expenditures on overheads and infrastructure. Third, there is a growing awareness on the part of educationists and policy planners, of the decline in the quality of education, despite quantitative gains. Mass media can enlarge access to the best available teaching talent and benefit a large number of people.

5. Despite the potential offered by the mass media in extending the opportunities of education, policy-makers in many countries have been skeptical about the utility of new educational technology, for all too often such technology has been judged in terms of additional costs alone. This paper examines the relevance of educational technology based on mass media in developing countries and its cost-effectiveness. In order to highlight the difference between the conventional mode of instruction and the relatively new methods involving the use of media-based educational technology where the source of instruction is distant from the learner, the term "distance education" is used in this paper to describe the latter.

II. DEFINITION AND COMPONENTS

6. A World Bank report 1/ defines distance education as "an educational process in which a significant proportion of the teaching is conducted by someone removed in space and/or time from the learner". In practice, distance education usually involves a combination of mass media (such as radio, TV and film) so as to compensate for the limitations of an individual medium and derive the maximum advantages from all the media used.

7. The media used in distance education are generally reinforced through correspondence studies and tutorial/practical sessions. The principal programs of distance education programs are: (a) teacher in-service training, mainly through broadcasting and correspondence courses along with optional tutorial/practical sessions; (b) enrichment

1/ Perraton, Hilary, Alternative Routes to Formal Education, World Bank, 1982.

courses, through radio, TV, or correspondence for teachers and students; (c) academic courses for those not attending school or college; and (d) adult education programs. The advent of the mass media and the emerging role of communications have shown that education need no longer be limited to face-to-face learning situations. In societies which have provide unlimited access to the electronic and print media, the time devoted by an individual to reading, listening and viewing exceeds that spent in traditional learning. Studies conducted by international agencies such as UNESCO, the World Bank and the Agency for International Development (AID), the British Council and the Open University of Britain show that the media such as radio, television and film - can teach people with little or no formal education and bring benefits to the very doorstep of the recipient. A World Bank report 1/ explains the situation as follows:

> "The demand for school places is beginning to outstrip the capacity of many economies to supply them. At the same time, technical changes in medicine, in agriculture, and in engineering mean that new ways of living are open to many adults - but may be open only if they have received some relevant education. This double demand, for schools and for adult education, puts a strain on educational systems that few can bear. The scale of the demand has led to a search for alternative methods of education that can reach more people, or reach different people, or do so more cheaply. Distance education offers some of these possibilities."

If distance education is well structured, and if a variety of media is used and feedback is provided for, it can offer a new approach to learning.

III. AN OVERVIEW OF EXPERIMENTS

A. Early Attempts

8. Distance education dates back to the 1880s when a Swedish teacher of bookkeeping, Hause Hermod, continued to coach students by mailing the lessons to those who had left his town. About the same time, William Briggs, an English teacher, began to offer postal tuition to students who could not attend his tutorial classes. In the United States, the notion of a land grant college with a campus extending to the state boundaries led some universities to offer correspondence courses in the 1890s.

9. In the late 1920s, the USSR adopted distance education to increase the output of the education system. Since 1929 correspondence courses have formed a significant component of the Soviet education system. Distance teaching in the USSR has been closely integrated with the regular system of higher education and students can switch courses ranging from full-time to part-time and correspondence learning as they work for a degree or technical qualification. The system is also meshed with industry and students are encouraged to follow courses relevant to their work and to do practical exercises and projects at their place of work.

1/ Perraton, Ibid, 1982.

10. From the mid-1920s, radio has been used to supplement education in schools. In the U.K., for example, 10,000 schools had radios by 1939. By then, several thousand listening groups had been formed in that country to take advantage of adult education broadcasts. The idea of forming listening groups led to radio fora, first in Canada and then in India and Africa. In New Zealand, from 1937, radio programs were linked with correspondence education. A series of projects linked broadcasting with correspondence and face-to-face instruction.

B. Use of Radio

11. Radio is used widely for educational purposes. Radio study groups or fora as a means of adult education are largely utilized in countries such as Sweden, Canada, India, Ghana, Niger and Tanzania. Most of these countries have attempted to make the fora part of continuing education. India is the first developing country to adapt the Canadian Farm Forum experience to a largely illiterate and poor rural population 1/. In Niger, members of the Niger Radio Clubs are themselves involved in the production of radio programs 2/, while in India and Ghana, the programs are mostly produced by radio stations.

12. The Honduras project, based closely on that in Columbia and similar to the Radio Schools projects in Peru, El Salvador, Mexico and other Latin American countries, sets out to teach formal basic education including literacy and arithmetic, besides providing programs related to religion, health, agriculture, civics and sports. Radio programs constitute the core of the instruction and are supplemented by wall charts and other printed materials 3/.

13. In the U.K., the BBC broadcasts a program based on folklore, called The Archers. The program which began some 30 years ago as part of a drive by the Ministry of Agriculture to modernize farm practices, commands an audience of millions. The characters portrayed are widely known and the programs, broadcast on five days a week, attract urban as well as rural listeners. Many developing countries, e.g. Bangladesh, Republic of China, Nepal, Pakistan, Sri Lanka, Botswana, Tanzania, Uganda and Zambia, use the medium of radio for education.

14. A church-based organization in Rwanda has developed a set of film strips covering much of the national primary school syllabus especially in literacy, mathematics and French. These are linked to radio programs for use in special primary schools set up in the less developed areas of the country.

1/ Mathur, J. C., and Neurath, P.: An Indian Experiment in Farm Radio Forums, UNESCO, Paris, 1959.
Schramm, W., Ten Years of Radio Forums in India in New Educational Media in Action, Vol. 1, UNESCO, Paris, 1967.

2/ Lefrance, R., Radio Clubs in Niger, in New Educational Media in Action, Vol. 3, UNESCO, Paris, 1967.

3/ Lyle, J., The Radio Schools of Honduras in New Educational Media in Action, Vol. 3, UNESCO, Paris, 1967.

15. Some authors such as Frey hold that through radio one can not only motivate pupils and make a topic more meaningful but also start new processes such as participation, dialogue and interaction in the classroom, which can develop the pupil individually and socially 1/.

16. The Nicaraguan Radio Mathematics Project (Lesson 171) won the highest honor awarded for educational radio programs in the eleventh biennial competition sponsored by the Japanese Broadcasting Corporation, Nippon Hoso Kyokai (NHK). In 1982, Projecto Mathematic, one of the 166 entries from 92 broadcasting organizations won the Japan Prize for International Educational Programs. Preliminary results of this innovation showed that the students in radio classrooms seemed to remain attentive for the full 30 minutes of each radio lesson and were equally keen to hear the instructional as well as entertainment portions of each broadcast. In addition, two series of year-end tests showed that the pupils in classrooms in which radio programs were used along with related teacher-led activities learned more than their peers in traditional classrooms.

17. McAnany, on the basis of his review of development-oriented projects in the developing world reported that educational radio is reaching only a fraction of its audience and that the potential of the radio as a medium of education has not been fully exploited 2/.

18. Radiovision is another development in this area. The BBC claims to have started Radiovision systematically in 1964. Sound tapes with either film strips or slides accompanied by a teacher's guide are used on a wide range of themes aimed at schools and post-school institutions. Sweden produced as many as 60 new radiovision series in 1976, while Denmark Radio made about 50 new radiovision series for schools during 1976/77. Radiovision may offer a cheap substitute for educational TV. In the West, however, there is a widespread opinion among teachers and media personnel that the child, exposed to high-quality TV programs, and being increasingly able to get access to a treasury of video and home computer of entertainment and knowledge, will not accept 'old-fashioned' technology of stills and audio-cassettes. The effects of Radiovision of the BBC have not yet been systematically monitored. Future growth of radiovision in developed countries is therefore uncertain.

C. Educational Television

19. Some innovations involving electronic mass media have emerged in recent years. The capacity of TV to supplement significantly the educational content provided by schools has been well established by such programs as "Sesame Street" - a popular educational program for

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1/ Frey, Christer, Trialog : - A Research and Development Project, Paper Presented in International Conference on Evaluation and Research in Educational Television and Radio, Open University, 1976.

2/ McAnany, Emile, Radio's Role in Development: Five Strategies of Use, Academy for Educational Development, Washington, D.C., 1973.

children devised and shown in the U.S. Carpenter has reported that "Sesame Street" is viewed in the U.S. by a large number of children of pre-school age and in the first grade 1/. Reports of the Television Agricultural Secondary School in Poland indicate that TV lectures are regarded by students as an attractive form of studies. The students also expect the TV system to provide a high standard of teaching using attractive and efficient teaching methods 2/. Mayo et al have reported that the majority of Salvadorian students are favorably inclined towards instructional television and those exposed to TV fared better in general ability tests than did their peers who were not. The data also indicated that disadvantaged children and those with low general ability have been more favorably oriented towards the television series than their more advantaged peers 3/. Haye has reported that educational television (ETV) in Hong Kong has been associated with a marked improvement in the pupils' attention span, their concentration and ability 4/.

20. Though television has not yet been extensively used in developing countries for non-formal education, quite a few experimental attempts have been made. One of the pioneering programs was started in India in 1961 when a program for farmers, called Krishi Darshan was televised in collaboration with the Indian Space Research Organization, the Indian Agricultural Research Institute and the Delhi Administration 5/. In a survey of non-formal education, Ingle cites reports of two developing countries using TV for non-formal education, viz, India where TV programs are being transmitted to a number of villages, and Senegal where teleclubs have been formed based on television programs 6/. In 1975/76 India conducted, with the assistance of an American satellite, ATS-6, a Satellite Instructional Television Experiment (SITE) for one year. This experiment which covered 2,400 villages brought out the potential of the new medium in assisting the country's educational, health and other instructional programs. Later in 1983, the Indian Space Research Organization conducted communications experiments through the experimental communications satellite, APPLE. An advanced course on

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1/ Carpenter, Polly, Cable Television: Uses in Education, Rand-Santa Monica, 1973.

2/ Januck, R., The Television Agricultural Secondary Schools in Poland, Paper presented in International Conference on Evaluation and Research in Educational Television and Radio, Open University, 1976.

3/ Mayo, John K., et al. Instructional Television in El Salvador's Educational Reform, Prospects, Vol. V, No. 1)75.

4/ Haye, Colvyn, ETV Evaluation Techniques in Hong Kong, Educational Broadcasting International, December, 1973.

5/ Schramm, W.: Ten Years of Radio Rural Forums in New Educational Media in Action, Vol. I, UNESCO, Paris, 1967.

6/ Ingle, Henry T., Communication Media and Technology: A Look at their Role in Non-Formal Programs, Washington, D.C., Academy for Educational Development, 1974.

robotics was televised simultaneously for students in the Indian Institutes of Technology and engineers located in different cities. Bourret reported two rural television experiences under way in the Philippines - one in Cebu and the other in Negros - as examples of cost-effective use of television in rural areas of developing countries 1/.

D. Technical Education

21. Contrary to popular belief, experience in some countries shows that technical and science subjects such as engineering, physics and chemistry can also be taught effectively through distance education techniques. In countries with scattered populations such as Australia and New Zealand or in countries determined to train all their available manpower to a high level, such as the USSR, distance education is used for teaching technical subjects. Recently, some developing countries faced with a chronic shortage of skilled labor have been experimenting with projects for teaching technical subjects by correspondence. At the university level, for example, in an engineering degree course, there is a large amount of highly theoretical work which can be studied outside the college. The practical work can be done in short, intensive sessions at weekends or vacation institutes. The Open University in the U.K. is an example where radio and television are used together with short compulsory courses to teach practical, work-related aspects of science, computers and technology. The Technical Correspondence Institute in New Zealand, by arrangement with employers in the private sector, enables students of the institute to do laboratory work every year for short periods.

E. Experience In Asia and the Pacific

22. In Asia and the Pacific, distance education is spreading rapidly. New forms and structures implemented in the region relate to technology education, teacher training, open university and university on the air programs. In Australia the technology education project introduced in the Darling Downs College of Advanced Education focuses on distance training programs in engineering technology and related areas. The project, which aims at widening the opportunities for technology education and training, can augment and improve local manpower for technical jobs. In India, the Ministry of Education has an ongoing program for the use of the country's domestic satellite, the Indian National Satellite System (INSAT), for school and adult education and for teacher improvement. 2/ The University Grants Commission (UGC) is implementing a scheme for use of INSAT for higher education in universities and affiliated colleges. Currently, educational television (ETV) programs for schools via INSAT are being telecast five days a week

1/ Bourret, Philip, Television in Rural Areas: A Low-cost Alternative in Educational Television: A Policy Critique and Guide for Developing Countries - A Report to the Ford Foundation by Robert Arnove and Arthur Coladarei, May 1973.

2/ INSAT Coordination Committee, The Indian National Satellite System, Government of India, January 1984.

in selected districts of Andhra Pradesh, Orissa and Mahasashtra - a total duration of about 45 minutes per day and one program each for the age groups of 5-8 years and 9-11 years. Every Saturday, there is a program for teachers. This service will be introduced progressively in other selected states (Bihar, Gujarat, Uttar Pradesh). Currently, the program production for ETV is shared between Doordarshan (National Television Broadcasting) and the Central Institute of Educational Technology (CIET) of the National Council for Educational Research and Training (NCERT). NCERT is enlarging the TV program production facilities of CIET and the Ministry of Education is sponsoring the development of State Institutes of Educational Technology (SIET) in the states covered by INSAT-I for assuming in the long run, much of the ETV program production responsibilities.

23. In Malaysia the off-campus academic program at the University Sains Malaysia represents the core of the country's efforts at distance education on a large and concerted scale. Basically, the program aims at enabling students to prepare themselves for degree programs in chemistry, biology, physics, mathematics and social sciences. The Open Universities in the Republic of China and Thailand offer opportunities to their students for pursuing advanced studies. Japan's University on the Air is seen as a core system of higher education and provides for life-long education of its students.

24. Distance education programs in one form or another are also emerging in many other countries of the region. To cite a few are the programs conducted by the following: the School Broadcasting Program, Bangladesh; various institutes of correspondence courses in India, including SNDT Women's University and the Open School of the Central Board of Secondary Education, Delhi; Distance Education Faculty, University for the Studies of Literature and Humanity, Iran; Correspondence School, New Zealand; Allama Iqbal Open University, Pakistan; Korea Correspondence College, Republic of Korea; Radio Education in Nepal and Open University in Sri Lanka.

IV. ECONOMICS OF DISTANCE EDUCATION

25. The educational systems of low-income countries share many common problems including rising costs; fiscal constraints; low quality of education; slow response in providing education relevant to development goals; and inadequate access to good education for many groups. Attempts have been made in several developing countries to explore the use of distance education to reduce costs, improve quality and relevance, or enlarge access to a better education. A discussion of some case studies on the cost-effectiveness of distance education will indicate some of the issues involved.

26. Jamison and Orivel summarize the data on costs and effectiveness of distance education obtained from a study of more than a dozen country case studies 1/. All the studies covered related to formal

1/ Jamison, D. and Orivel, F., The Cost-Effectiveness of Distance Teaching for School Equivalency; Perraton, op. cit.

equivalency programs, i.e., they catered for the requirements of existing in-school and out-of-school projects. The authors' approach was based on the assumption that a linear function represented adequately the cost structure of distance education where costs could be divided into two categories: "fixed costs" and "variable costs". For example, the costs of preparation and transmission of a broadcast are 'fixed' whereas the cost of reception are 'variable'. The project's impact was assessed in terms of comparative unit costs as well as its effectiveness.

27. Jamison and Orivel concluded that the proportion of fixed costs to total costs of distance education is high (often exceeding 50 per cent) and well above that of conventional teacher-class instruction. The authors find that enrolment levels are crucial for long-term viability of distance education programs so that the annualized value of capital plus other costs can be spread over a large number of users during the project's lifetime. Increased enrolment reduces the unit cost of distance education.

28. A few guidelines on viability in terms of unit costs also emerged from these case studies. For instance, the higher the academic level, the lower would be the number of potential clients required, other things being equal, to make the course cost-effective. In conventional, formal programs the cost of the teacher is the major element in the total cost. In most countries teachers engaged in higher education earn more than those in primary education. A university teacher gets three to eight times the salary of a primary school teacher, therefore pedagogy in higher education can more easily accommodate substitution of labor by capital. The authors conclude that there was evidence of positive effects of the equivalency programs on quality as judged by academic success and consideration of increased access to opportunities. Most of the projects under study were found to be less expensive than equivalent regular programs and that distance education could be cost-effective for both quantitative and qualitative improvement.

29. Some other case studies (though somewhat outdated) provide useful data on cost-effectiveness of distance education. Schramm 1/ on the basis of his survey of a range of media projects operating two decades ago, stated that most of the projects were underutilized and felt that if their services were extended to more users or if the media were used to put out more programs, (or both), the media could operate a great deal more cheaply in terms of unit cost. If television receivers were used to the maximum extent, with an audience numbering hundreds of thousands, it would be theoretically possible to reduce costs for instructional television broadcasting to "1.5 cents per student-hour". Schramm further stated that though data on the use of radio were too limited to generalize, it looked as if the cost of using radio per

1/ Schramm, W., et al., The New Media - Memo to Educational Planners, Paris, UNESCO: International Institute of Educational Planning, 1967.

student-hour might be in the order of one-third to one-fifth of the cost of television used under comparable conditions. Vaizey, Howton and Norris stated that justification for the introduction of new educational technologies might be found in areas where there are too few teachers, or where teacher performance is poor, or where the subject itself inherently demands visual presentation which cannot be offered by a teacher 1/.

30. Wagner studied the economics of the Open University of U.K. and concluded that the average recurrent cost per undergraduate is a little more than one-fourth of that incurred in a conventional university; the capital cost per student is found to be about 6 per cent of its conventional equivalent and the resource cost (learning materials, tutors, seminars, etc.) is only one-sixth of the normal cost in a conventional university. Furthermore, he concluded that the average recurrent cost per graduate indicates that the costs of the two types of institutions would be equalized if the open university had an 85 per cent drop-out rate 2/. Laidlaw and Layard found that in all courses but one, the variable cost per student is substantially lower in the Open University of U. K. 3/. These findings also constitute a case for the expansion of existing courses offered by an open university. The paper does not consider the opportunity cost, but if this is lower for open university students, it would be a further argument in favor of the open university approach. Knoepfli found that a media-based course appears to be more economical than a traditional university course when a large number of students are involved. A media-based course has a high development or production cost but a low variable cost; in other words, the marginal cost in a media-based course is low 4/.

31. There is also evidence to indicate that distance education is much less expensive than the conventional one. The cost of running comparable courses is 40 per cent less in the Open University of Thailand than in a conventional university. The cost per student in the off-campus program at the Universiti Sains Malaysia is about one-fifth of that of an on-campus student. The Korean Air Correspondence High School provides education at about one-fifth the cost of traditional schools and enables students to earn and learn at the same time. Recent studies in Brazil, Kenya and the Dominican Republic confirm that correspondence courses have proved effective in remote areas 5/.

1/ Vaizey, J., Howton, E. and Norris, K., The Costs of the New Educational Technologies, Lisbon, Centro de Economia e Financas, 1971.

2/ Wagner, L., The Economics of the Open University, Higher Education, Vol. I, No. 2, May 1972.

3/ Laidlaw, B. and Layard, R., Traditional versus Open University Teaching Methods: A Cost Comparison, Higher Education, Vol. 3, No. 4, November 1974.

4/ Knoepfli, Heather E., A Cost Analysis Study, Arts 100: Communications, Toronto: The Ontario Educational Communications Authority, 1973.

5/ The World Bank, Poverty and Human Development, p. 18, 1980.

V. PROSPECTS AND ISSUES

32. There is scope for further initiatives in the field of distance education in Asia and the Pacific, especially because resources for regular formal and non-formal education programs cannot match the growth of the social demand for education.

A. Formal Education

33. There cannot be a clear dichotomy between formal and non-formal fields in education. What is intended as a formal program can become a non-formal experience for some viewers or listeners. Programs for target groups such as out-of-school youth, women, and the unemployed are useful even for those undergoing formal education.

1. Primary and Secondary Education

34. The possibilities for labor-capital substitution are limited in primary education because studies on child psychology and learning indicate that a strong teacher-pupil relationship is particularly advantageous in primary education. Moreover, even when educational technology is used in first level classrooms, it appears that 'teacher preparation' and 'teacher follow-up' in any distance education program are important factors. Nevertheless, if the costs are accepted as 'add-on', distance education can supplement and make up for the generally low quality of instruction in the region. Widening the curriculum, stimulating interest through the visual and aural channels and enhancing the knowledge of teachers seem worthwhile goals for distance education in primary schools. As universal primary education is achieved, experience shows that pressures for expansion of secondary schools is felt keenly. A shortage of teachers in mathematics and science, as well as in technical and commercial subjects often leads to unbalanced curricula in many secondary schools in developing countries. There is potential for distance education as (1) an alternative route to regular secondary programs (out-of-school programs), and (2) a supplement to regular teaching in subject areas where teachers are not available or are inadequately qualified for the curriculum. In the former case, a proper mix of in-school and out-of-school programs can achieve a degree of labor-capital substitution.

2. Teacher Education

35. The professional development of teachers is a continuous process. When society is changing fast and curricular reform is set in motion, there is a need to help teachers prepare themselves to face the new challenges. The teachers must be encouraged to undertake refresher courses, subject specializations and enhance their professional knowledge and skills. Distance education is potentially one way of providing in-service training to teachers. The costs of direct programs for teachers are likely to be in the nature of 'add-on' expenditure. Additionally, distance education can provide pre-service teacher education to compensate for the lack of specialist staff and increase the number of trained teachers in a limited time-frame.

3. Education Management and Administration (EMA)

36. Education systems and institutions in developing countries are generally undermanaged and poorly planned. Course-based training for head-teachers often takes them out of their schools and results in increased support expenditure (travel and subsistence payments). The capacity of the institutions responsible for running management courses to cater for sufficient numbers to make an impact on an education system is limited; however, there is good scope for innovative programs in EMA particularly in Southeast Asia which has a fairly large number of teacher-trainees and local education administrators.

4. Tertiary Education

37. The data collected by Jamison and Orivel suggest that unit costs of graduates of distance education programs are lower and that the quality can be good 1/. Labor-capital substitution is possible at tertiary levels of education, where student motivation for the reward of a degree or diploma obviates to some extent the need for constant supervision by the teacher. Distance education can make a positive contribution to tertiary education by reducing the pressure on the governments which find it difficult to increase the provision of additional and expensive educational facilities and resources. Through modest fees and a flexible course credit system, tertiary education can be delivered at minimal cost. People outside the cities where universities are traditionally located can also benefit.

B. Non-Formal Education

38. It is difficult to obtain data on non-formal programs under distance education. It would be appropriate to recall the experience reported under the SITE program of India. Under this program, schools were catered for in the morning, while the evening programs concentrated on agriculture, health and family welfare. It is claimed that a surprisingly large number of villagers liked these programs and in fact preferred information to entertainment. A discussion invariably followed the telecast and the feedback was encouraging. Popular science programs were received well. It showed that illiteracy was no bar to appreciating or even understanding scientific ideas. 2/

39. Basic knowledge as well as advances in health and family welfare, nutrition and agriculture can be communicated effectively through modern mass media. Education in the areas of civics, social responsibility, legal rights and national cultures are other areas where the potential audience is the entire population, young and old, illiterate as well as literate. The skills of TV and radio journalism can be coupled with the knowledge of experts in a wide range of fields to produce entertaining, informative and educative programs.

1/ Jamison and Orivel, The World Bank Report, 1982.

2/ Sundara Rajan, Mohan, Wonders of Space, National Book Trust, India, p. 46, 1971.

40. It is conceded that production costs of TV programs are relatively high but if audiences are large, fixed costs per head are considerably reduced. Governments still have the problem of ensuring the widest possible reception of programs. To begin with, receivers (TV and radio) have to be supplied by the government in some countries and this adds to unit costs. Low levels of rural electrification also pose problems. The logistics of supply and maintenance of TV in rural areas pose a further challenge to governments but can be managed reasonably well, as was proved in the case of India's SITE project. However, battery-operated TV sets need to be augmented technically for direct reception of signals from a satellite and the use of solar power for TV is still in the experimental stage. If the concentration of TV sets is fairly thick in an area, it could be economical to serve them through a TV re-broadcast station that would receive the satellite signal and beam it to conventional receivers. On the other hand, if the reception points are few and scattered over a wide area, augmented TV sets with provision for direct reception of the satellite signal may be cost-effective.

41. Britain's Open University and the Federal Republic of Germany's Telekollege are some of the other successful ventures in using TV for education in combination with high-quality learning materials. The responses to Telekollege and the Open University, the Chicago TV College and Sunrise Semester in New York suggest that TV may encourage a substantial segment of the adult population to seek opportunities for further higher education. Sweden has also decided to set up an Open University on the lines of the British facility. Louis and Rovan have reported that teleclubs in France are involved in a series of television programs aimed at creating public awareness of the life and conditions in rural areas and stimulating solutions to the problems faced by the villages 1/.

42. The teleclubs of Senegal which were sponsored by UNESCO televise two programs a week on hygiene, nutrition and treatment of various diseases 2/. UNESCO, on the basis of an evaluation of Senegal's distance education project pointed out that there are subjects which need more than one mass medium for effective communication 3/.

43. An important goal in distance education is the education of illiterates. The number of illiterates has increased in developing countries in spite of larger enrolments in schools. The conventional

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1/ Louis, R. and Rovan, J., Television and Teleclubs in Rural Communities - An Experiment in France, Reports and Papers on Mass Communication No. 16, Paris: Department of Mass Communication, UNESCO, 1955.

2/ Schramm, W. and Chu, Godwin, Learning from Television: What the Research says, Washington, D.C., National Association of Educational Broadcasters, 1967.

3/ Cassierer, H., Mass Media in an African Context - An Evaluation of Senegal's Pilot Project, Reports and Papers on Mass Communication, No. 69, Paris: Department of Mass Communication, UNESCO, 1973.

approach to adult literacy involving mobilization of vast numbers of paid or 'volunteer' teachers is not adequate to meet the challenge. For instance, a mass education program aimed at combating illiteracy in Bangladesh on the principle of one literate student teaching one illiterate had to be abandoned after 18 months. New methods based on mass media, particularly TV and radio, seem to offer an alternative. Illiterates are often not sufficiently motivated to acquire literacy, one of the contributory factors being the poor quality of many literacy education materials. The electronic media may raise the level of awareness among adults of the advantages of literacy. The use of electronic media can be supplemented by specially prepared printed materials suited to neo-literates as an integrated system of distance education. Moreover, literacy can also be linked to vocational education. Where skilled craftsmen and craft instructors are in short supply or are themselves deficient in some areas of their craft, distance education may yield impressive results, with possible improvement in literacy as well.

C. Issues

44. There can be no short-cut to progress in the use of educational technology. The development and use of educational technology require much more planning and a longer gestation period than do the classical teaching methods. If mass media technologies are to be used, there must be a mass clientele. While it is true that the economies of scale appear most dramatic through the application of these new forms of educational technology, it is equally true that the unit cost can be too big when the target population is small and production costs are fixed. Moreover, the technology should be planned and operated on a team basis. The team may consist of an engineer, a producer, a communicator, a teacher, and a sociologist. Furthermore, there is the need for feedback mechanisms to be built into every distance education program. As TV and radio are generally considered 'blind' one-way media, programmed instruction too can become a form of monologue. There must therefore be a system of evaluation and learning from the receiving end. There is also the technical aspect relating to the use of radio frequencies involved in distance education. The radio spectrum has to be used by individual countries, if need be, in coordination with neighboring countries in accordance with the principles laid down by the International Telecommunications Union (ITU).

45. In particular, the following issues merit further study:

(i) Determination of the priorities to be assigned in the use of distance education for formal and/or non-formal education. While in formal education, the results could be quantified, the impact can only be ascertained indirectly in the case of non-formal education, though the latter may well be preferred on grounds of national interest, cultural uplift and social development. The goals will depend on the priorities of individual governments.

(ii) An important aspect in introducing distance education is the development of appropriate educational content of the programs. Often the hardware tends to be overemphasized to

the neglect of software which is really basic to the success of the program. The programs must cater for the needs of the people for whom they are meant and should agree with the social and economic climate. The message is as important as the medium.

(iii) Distance education based on mass media offers a unique opportunity to de-mystify the technique of television and radio among the masses, and enables governments to decentralize program making and encourage participation of people at the grass roots. The new technology such as videotape recorders have de-mystified the business of visual communication. It is time to take full advantage of this development and encourage wider participation in programming.

(iv) One of the important teaching developments that has a bearing on distance education is the successful operation of communications satellites which can cover more than one location, region or country simultaneously. The direct broadcast satellite offers a unique chance to countries to coordinate their efforts and share the technology to have distance education at reduced cost.

VI. THE BANK'S INVOLVEMENT IN DISTANCE EDUCATION

46. Bank-assisted education projects have so far concentrated, largely, on the strengthening of educational infrastructure, particularly in the fields of technical and vocational education. It would now seem appropriate to explore the scope for encouraging innovative projects, such as distance education, on a selective basis so that the Bank might help its developing member countries avail themselves of the benefits of recent progress in the field of educational technology. Indeed, the opportunity exists to further the Bank's objectives of developing human resources and the technical managerial competencies in its developing member countries and for these activities to assume greater significance and purpose, as more and more of these countries, in the face of rising costs and teacher shortages, turn to distance education programs to provide education and training to different levels and categories of the populace. The participation of the Bank in distance education programs would enable the Bank to assist its DMCs, provide wider access to educational opportunities, and thereby hasten economic and social development. In addition, it will help in achieving national goals for education, such as universalization, vocationalization, and improvement of quality including standards of teaching.

47. Certain issues involved in introducing or operating programs relating to Distance Education need further study by the Bank and its DMCs; however, this study can benefit from the experience of countries which have already initiated projects in this field. The objectives and specific goals which are set by individual countries need also be studied and evaluated in the light of recent experience. It is therefore considered useful to have a continuing exchange of views

to provide an opportunity for member countries to clarify their immediate objectives and help identify possible projects for Bank assistance. The points of interaction might include: (i) models for distance learning strategies suited to developing countries; (ii) cost-effectiveness and the resources available for distance education in various countries which are preparing to adopt the method; and (iii) review of technological innovations and possibility of adopting them, including the sharing of certain common facilities where appropriate, such as space-based hardware.