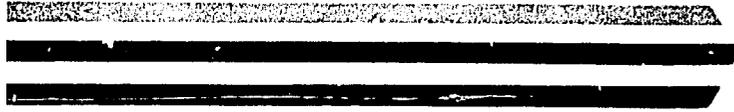


PD-AAR-782  
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PERSPECTIVES ON RADIO/COMMUNITY

BASIC EDUCATION

Prime Contract SF-147-PE-172

# AVANTE

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May 22, 1980

Dr. Patsy Lane  
USAID Development Support Bureau/Education  
S.A. 18 Room 311  
Department of State Building  
Washington, D. C. 20520

RE: Prime Contract  
SF-147-PE-172

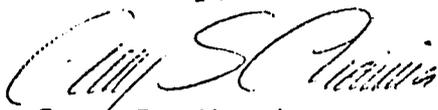
Dear Dr. Lane:

Enclosed is an original and 10 copies of a final paper entitled Perspectives on Radio/Community Basic Education. This, along with other contributions to the Radio/Community Basic Education project, will provide you with the following: a review of literature describing radio basic education; an analysis of previous and on-going radio instruction projects; a community-based education model utilizing radio instruction; and economic and technical analyses of radio based instruction.

We have enjoyed working with the Development Support Bureau/Education on this very valuable effort. If there is any way we can be of assistance to you in the future, please feel free to call on us.

Thank you.

Sincerely,



Cruz S. Chavira  
President

CSC/tm  
Enclosures

## INTRODUCTION

The availability of inexpensive radio receivers has spawned a widespread communications revolution in less developed countries. In 1978, it was estimated that there was approximately one radio for every twenty persons in nations assisted by the U.S. Agency for International Development. As the cost of radio receivers continues to decrease as a result of electronics innovations and mass production, the number of persons owning radios continues to increase. As a result, radio transmitters beam programs to regions which have had little previous contact with the more developed world.

The benefits of radio are numerous and obvious. It is a relatively cheap medium of communication, requiring no physical link between the broadcast and the listener. Broad target populations can be covered in a broadcast area, since transmission distance is a function of the wattage of the transmitter. Radio can penetrate natural barriers which have historically isolated pockets of population with ease since radio waves are ubiquitous in the transmission area.

Radio can serve many purposes: to provide a link with the mainstream of national life through music, cultural programs and news; to market products and services through the advertising medium; and, to deliver instruction and other

learning services to persons who might be denied social or physical access to conventional educational programs.

The U.S. Agency for International Development has maintained a strong interest in the use of radio as an instructional tool. A.I.D. has sponsored a number of experimental radio efforts for varied purposes, such as enhancing agricultural productivity, supplementing primary education and providing mathematics instruction. As part of this continuing effort, the Agency's Education Development Support Bureau is seeking to develop a project to provide community basic education through radio instruction.

The first step in this process is to conduct an evaluation of previous and current radio instruction projects. Such information is vital to assess the economic and technical feasibility of the project as well as to draw guidance from the negative and positive aspects of earlier efforts. AVANTE International Systems Corporation was contracted to carry out the evaluation of previous and ongoing radio instruction, particularly those directed toward providing basic education. Following is a monograph entitled Perspectives on Radio/Community Basic Education, which contains an evaluation of previous and on-going radio projects, and a summary of factors affecting the economic and technical feasibility of this strategy.

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## PERSPECTIVES ON RADIO/COMMUNITY BASIC EDUCATION

The purpose of this report is to provide an overview of radio as a communications medium in the context of community basic education programs; and, to review, in digest form, seven such programs: Accion Cultural Popular in Colombia, the Basic Village Education Project and the Basic Rural Education Project in Guatemala, Radio Santa Maria in the Dominican Republic, Radio Mathematics Project in Nicaragua, the Rural Radio Education Project in Paraguay, and Radio Primaria in Mexico.

The primary use of radio education has been threefold: (1) to reduce educational costs per student; (2) to expand access to education for individuals who because of isolation or inability to matriculate in a formal setting find it difficult to attend traditional schools; and (3) to enhance the quality of educational services already offered. Indeed radio, in this context, is the medium of choice which offers the greatest promise to fulfill the need of low-cost, broad-based, relevant education. Education in literacy, decoding and numeration can be the channel into the mainstream of a culture, for people previously denied this access. Experiments and efforts to use radio and radio multi-media (radio in combination with certain printed materials) have been attempted in many areas of the world. Some of these have met with great success and others with frustration and limited success.

Inherent in the success of radio as an instructional medium is the need for motivating the learner through involvement and identification with the programming. Learners have been involved in the actual production of programs. For example, Radio Mensaje, in Ecuador operated a radio school staffed by voluntary group leaders who used cassette recorders to solicit programs from local participants for broadcasting in two half-hour programs per week. The programs were produced for rural people by rural people. The production of such materials at the grass roots level was coupled a substantial increase in the number of listeners. An evaluation of the project suggests that this approach leads to an increased involvement and identification on the part of listeners, and this should make it easier to persuade listeners to accept some of the innovations they hear on the radio. It is reasonable to conclude that active involvement of a target audience is a desirable trait for any radio effort. The relationship between a sponsor/provider and audience must remain two-way and flexible. Feedback is essential.

In the Nicaraguan Radio Mathematics Project stress was placed on active learner participation. An average of five student responses per minute were elicited during radio broadcasts. These responses could be oral, written or physical. Mathematical concepts, arithmetic skills, and problem solving abilities were all taught in a direct, down-to-earth style that children could understand and appreciate. Lecturing

and the use of technical vocabulary were held to a minimum and songs, jokes, riddles, stories and games were interspersed among the mathematical segments. The quick pace of broadcasting, the keen interest of the children and the careful sequential development of mathematical concepts and skills have prompted some to characterize the program as a cross between Sesame Street and programmed instruction.<sup>1</sup>

In terms of cost-effectiveness radio has to its credit very low per capita cost as compared to other educational approaches. Radio programs are less expensive to produce, deliver, and modify for re-use than is face-to-face instruction.<sup>2</sup>

This is not to say that radio is a panacea for rural, non-formal education. Radio must be part of a broader learning system. The system must deliver information that is desirable to and needed by the listeners; and, the listeners must have some way to interact with the radio.

Because of low cost, and relatively little down time in program preparation, radio programs may be made extremely effective by being prepared for a certain locality, or several different specific localities. This location-specific

<sup>1</sup> Barbara, Searle, Institute for Mathematical Studies in the Social Sciences, Stanford University.

<sup>2</sup> Jamison, Dean, Cost Analysis for Educational Planning and Evaluation, Princeton, N.J., Education Testing Service, 1976.

potential of radio gives it an immediacy and familiarity that also serves to create and reinforce positive listening.

Once a decision is made to use radio to reach non-urban, rural groups, the first priority should be to gain a special and specific understanding of the group for whom the programming is intended. The use of indigenous folk media and low cost technologies already present in the area has proved to be beneficial, especially in the Colombian ACPO project.

Coordination of sponsor agencies, program developers, recipients, and field staff also contributes to the greater good of the project. Field staff, generally instructors, must possess special skills to bridge the distance between the radio program deliverers and service receivers. To be most effective, field personnel must be aware of their vital role as the main conduit for feed-back. These individuals will be the first to see the effect of the program, and the first to carry back to the developers the modifications necessary to refine the process.

In summary, radio as a communication medium for non-formal education in rural areas is an exciting and "alive" information delivery system. It is cost-effective, local-specific, and, in many of the cases to be reviewed here, a very efficient educational technology.

## ACCION CULTURAL POPULAR - COLOMBIA

Accion Cultural Popular (A.C.P.O.) is the oldest existing radio instruction program in America, having been started in 1947. It is both successful and extensive, reaching some 25 million Colombians with community service-action programming and program for the primary grades.

The original purpose of ACPO was to alleviate the negative socio-economic aspects of poor, rural campesinos. These rural folk had been isolated from the mainstream of Colombian national development. It was felt that they needed a way to acquire reading, writing and number skills; advance in their practical knowledge of modern agricultural practices; and to develop certain economic and social skills so as to become more responsible for their own personal development.

Radio is found in ACPO in a multi-media content. It is accompanied by a weekly newspaper, El Campesino, and additional written texts. It is significant to note that El Campesino contains information of broad general appeal and occasional contributions by campesinos of articles and poetry. The loop of reciprocity, or feed back, in ACPO, is accomplished by the use of correspondence. Once a campesino has acquired literacy he may ask directly for special information or assistance. Approximately 50,000 such letters are received and answered each year. If a situation warrants, special trips or excursions are made into the community. A field worker is typically enrolled in this kind of direct

service. From a topic can come whole campaigns of up to a year or more. This kind of polishing of the system is part of the reason for the success of ACPO. Additional information is dispersed through mobile units distributing such items as audio-visual equipment, leaflets, etc.

People working for ACPO come from two basic groups - volunteers who span the age spectrum from school age children to adults, and the professional staff, including about 20 professors who are centrally responsible for curriculum development and ancillary materials and programming. In all, there are about 20,000 persons involved in ACPO programming.

ACPO is an advocacy system. It sees its role as an agent for exchange for the betterment of its audience. This kind of classic grass-roots community organization has been successful since the project was begun by the Catholic Church. The support system is weighted in favor of the system recipients, not top heavy with administrators and others who might not have to live with the product of the effort.

The depth and extensiveness of ACPO are impressive. There is some doubt that a model which was as elaborate as this, in the beginning, would meet with success in an area which previously lacked either a radio instruction project, or the resources to facilitate such a program. There is also the question as to the amount of transferability of this style of program or specific model to countries where communications are controlled by the government, where the

church is either disinterested or unaccepted; or, there was not an universal national language and no formal schooling in the service areas. The model does give itself to both modification and orientation, and is, therefore, very useful.

The ACPO program has been found to be a very positive agency for growth and development of the Colombian campesino and his family. The growing popularity of the project attests to its effectiveness.

Cost effectiveness of the ACPO project, like most radio efforts, has been difficult to obtain. The multifaceted approach, with numerous target audiences, probably touches every Colombian citizen, but to a varying extent. There have been no formal, comprehensive evaluations of the project in terms of cost per listener or of program effectiveness.<sup>3</sup>

<sup>3</sup>  
Nelson Velandia, U.S. Representative for Radio Sutatenza, ACPO.

## THE BASIC VILLAGE EDUCATION PROJECT - GUATEMALA

Rural people of Guatemala have a life setting which is common to many developing countries in the world. The condition is one of poverty, poor health maintenance and illiteracy. To improve the prospects for expanded educational access, the decision to use modern communication technology was made. The Basic Village Education Project was a manifestation of that decision.

The two regions, the Oriente and the Occidente, received a mix of radio instruction and learning support services based on a rigorous research design. The project design had four major communication/media combinations. Radio was common to three of these. They are:

Treatment R (Radio): Educational messages were conveyed to the target population only through mass media radio.

Treatment RM (Radio-Monitor): Added interpersonal contact to the media effort was achieved through the use of a local monitor. He was employed and trained by the project to work directly with the farmers in his own region and areas immediately proximate.

Treatment RMA (Radio-Monitor-Agronomist): This was the most intensive of the four formats in that it included the media and the addition of an agronomist. This agronomist gave only elementary agronomic assistance.

Treatment M (Monitor only): Added later in the project.

This was done to ascertain the effectiveness of a monitor only. He was used in the areas where radio signals were not received.

It is significant that pre-planning and planning in the classical sense preceded the actual broadcast effort. The target population was studied and their pressing needs analyzed and a design to meet these needs was set forth prior to programming and broadcasting. Various departments of the government of Guatemala cooperated with the strategic design of an effective program.

The project adopted the name Radio Basica Educativa and broadcast a mix of pre-recorded and live programs. Approximately 20 percent of the programming was directed to agriculture activities. According to listener surveys, the station was able to capture and maintain a large listening audience. A BVE monitor had a typical caseload of four or five communities and about 110 to 250 farm families. Special limits determined the size of the caseload for the monitor. These were community size, accessibility, and social units.

A continuing study of the people preceded all elements of the program. This was considered crucial if the program was to be appropriate and accepted by the people for whom it is intended.

Radio forums were convened in many communities. Meetings and discussions grew in size to about 1500, including

some 16,500 adults. The function of these forums was to exchange ideas and learning. As with ACPO, feedback and two-way communication - being able to talk back to the radio - was an accepted necessity in the design and was achieved through correspondence. These were augmented with reports from agronomists and monitors in the field. In course, modifications and adjustments showed responsiveness to the changing awareness of both the providers and the recipients of the service. Cost effectiveness was very favorable. Expressed on a per-farmer-reached basis, the treatments cost the following: R=\$4.34, RM=\$21.25 and RMA=\$31.57.

The evaluation of BVE was rigorous and the findings were as follows:

1. The BVE educational program had a significant, positive impact. Some 29 new agricultural practices were adopted as compared with the control group.
2. Radio was extremely effective in bringing about changes in knowledge, attitude and in behavior. It is clear that progress was made in other than simple mechanical terms. When a group feels they are progressing, in their own terms, there is a genuine spiritual benefit and growth. the circle of awareness is widened.
3. BVE succeeded because the radio was "personalized". Again, feedback gave the breath of life to the relationship between sponsor/deliverer and recipient.
4. The impact of radio diminished over time. Personal visits became more significant. Evidently dependence

was transferred to a yet more "personal" system. This would include the change of the status of the monitor, increasing with time spent in the field.

5. The greatest impact was in the areas in which the agronomist was combined with the monitor and the radio.

In summary, BVE evaluation findings indicate that radio is an effective change medium when used IN COMBINATION with highly developed message preparation and feedback. Radio was clearly effective in bringing media to the people.<sup>4</sup>

<sup>4</sup> Ray Howard, Field Program Leader, BVE Program.

## RADIO MATHEMATICS PROJECT - NICARAGUA

The aim of the Nicaragua project was to fill the need for an educational media presentation that relied primarily on radio. The first stage of the project, which lasted for about a year, was spent in selecting an appropriate project site. Three principal selection criteria were employed, a location where: 1) there were no current radio instruction programs; 2) where the native language of the people was to be used for instruction; and 3) where the host country government was ready to support the project with local staff and facilities.

The decision of site was also concerned with technical considerations, such as the availability of radio transmission facilities, skilled technicians, the size, soil conductivity, and population of the area to receive the radio instruction. Generally, the most important criteria for site selection were the educational level of the population to be served (the lower the better) and the level of interest of the host country government. Education is essentially a human, social endeavor, and therefore curriculum and technical considerations should always be secondary to the cultural context.

The second stage of the RNP was the development and evaluation of the radio instruction system. The exclusive focus was on the basic instruction of mathematics, which was unique at this time. There had been little work in the

curriculum developed for radio instruction, and the RNP brought with its focus on mathematics, a new level of sophistication in curriculum development. The primary element of this was the continual feedback from the field in the development of each lesson.

The RNP followed the mathematics curricula of the Nicaraguan Ministry of Education, which had just been reformulated. Using the same basic curriculum facilitated comparisons of the achievement of project recipients with students in traditional classrooms. This policy also facilitated the acceptance of the RNP by the teachers and its integration into the regular educational system. These factors are crucial for both the success and the continuation of a radio instruction system.

The RNP was responsible for all of the mathematics instruction received by the target population. A daily lesson consisted of 20 minutes of radio presentation and approximately another 20 minutes of "teacher-directed" activities. The instructions for the teachers were in a project-developed guide; there were no textbooks, and printed material was limited to one-page worksheet per student per day. The project staff believed that little was added by more extensive use of printed and display materials, and that any variations in the future of radio instruction would involve lowering these costs even further.

The original one year plan and the lessons were substantially altered throughout the year as a result of two

kinds of feedback: classroom observers and weekly tests of the students.

A very substantial feature of the RNP was the weekly testing of the students and the corresponding alteration, or creation, of the on-going plan and lessons. This immediate objective and empirical feedback tied to the development of the curriculum is outstanding and should be the core of any radio instruction curriculum development regardless of subject or geographic area.

The pace of the RNP broadcast was extremely quick, demanding an average of five student responses per minute of either an oral, written or physical nature. It was found that this response pace enhanced the interest and thus the learning of the students. It was also found that the focus of the teachers' attention changed from the high ability students (as in traditional classrooms) to the low-ability students.

The RNP documented the successful use of radio instruction as an inexpensive instructional technology and its special advantages (consistency of instruction and more attention for low-ability students). Second, it demonstrated that dropout, repetition and promotion are highly related to factors other than radio instruction. Third, it isolated four variables that correlate highly with achievement; namely, student participation, student verbalization, time with nothing to do, and, time devoted to mathematics. The major achievement was the on-going alteration of the

programming as a result of the feedback from the field.<sup>5</sup> The early broadcasts are quite different from late broadcasts. The RNP staff rightly conclude that their success in raising student achievement is not due to unique qualities of the radio but the way in which it is used.

Cost effectiveness data would be of questionable value for this research and demonstration effort. Since Radio Mathematics, mathematics curriculum had to be designed and a support system developed. There was significant up front cost for the project which should justifiably be spread over a number of years, not just during the project period.

<sup>5</sup> Jamesine Friend, Institute for Mathematical Studies in the Social Sciences, Stanford University.

## BASIC RURAL EDUCATION - GUATEMALA

The Basic Rural Education Program (BRE) was developed to establish a viable organization with operational capacity and resources to design, develop and implement an efficient low-cost, multi-sectoral program of nonformal education activities sponsored by diverse governmental institutions under the direction of a National Commission for Non-Formal Education. The participating institutions are: Ministry of Education, Ministry of Health, Agricultural Services, Community Development, Army Education Programs, INTECAP and the National Economic Planning Council.

The program operates in five highland Guatemalan Departments of San Marcos, Quetzaltenango, Solola, Sacatepequez and Chimaltenango. The program staff works with 125 rural communities in those departments. Initial activities concentrated on the development of institutional working groups and with a community participatory methodology. Field level work in the project includes regional programming in Quetzaltenango and coordination with cooperating institutions and the rural communities.

The Coordination Secretariat of the National Commission has a working unit in Guatemala City producing audio visual materials, didactic materials and radio programs that are integrated into the field education programs. Materials and content units are produced and sent to the field level for used by the promoters and institution

technicians. Radio instructional messages and programs are produced for radio broadcasting and cassette use in the communities. Radio educational programs with agriculture, health, hygiene, and community themes are transmitted daily on two local radio stations in San Marcos and Quetzaltenango. The radio programs support promoter and technical activities in the communities. Radio is also used for promoting community activities.

About 250 promoters from the National Commission and 500 other volunteer campesino leaders work with the rural communities. Promoters stimulate participation by the community, give demonstrations for individual experiences and use group techniques to facilitate teaching-learning actions. Promoters assure that the groups compare learning materials received with their actual experiences.

In the absence of technicians, and after the demonstration, promoters stimulate reflexion and analysis, discuss the advantages and disadvantages of the content material and attempt to understand the implications of taking action on the information. In this practical phase, theory is united with practice. Groups decide to adopt or reject the new information. Promoters stimulate the group to understand the significant differences between the information content and local experiences.

Support groups are the integration of one or more government institutions or private groups that unite their efforts to serve the rural communities. They develop

integrated educational content and activities. Support groups are the connections between the Secretariat and the different institutions for developing content materials. They propose with the communities the programming of different actions that will take place with the program.

There are several major problems associated with the project:

1. There has been a limitation on the part of the NFE Secretariat to provide a larger number of promoters partly because the rate of program expansion has been slower than expected. Also, there are not enough inter-agency technicians to team up with the promoters.
2. The NFE Secretariat has not received the MOE support needed to develop to the level required (according to project design) for NFE radio delivery system, the community needs assessment system, the research and evaluation system and the content/material development and feedback system.
3. There are organizational and managerial problems in the relationships between the Secretariat and the Regional Office. For instance, technical personnel are concentrated at the NFE Office in Guatemala City, while the regional office is virtually without technical and support personnel. Radio and printing facilities are overly centralized at the NFE Secretariat. Thus the regional office has been limited in terms of flexibility and/or resources to plan, design, execute and

evaluate pre-service and in-service training of promoters, and to respond to requests for educational materials by the promoters.

4. Sufficient inter-agency coordination in relationship to NFE activities is developing at a very slow pace.

Impact:

The BRE program has directly served about 10,000 individuals per year since its inception in 1976. Nearly 300 promoters and about 500 community volunteers are working in 145 rural communities. Promoters are selected by their communities, they in turn identify community volunteers. The real strength of the program seems to be in the helping relationship that has developed between the regional office and the rural communities it serves. Regional office personnel are assisted by departmental and zonal coordinators to supervise the work of promoters and volunteers. Materials support and training needs are identified by this process. It has been at the field level and in this process that the AED technicians seem to have made their best impression. Yet it has taken a long time for them to become effective, and only now are the Secretariat and Regional Office developing confidence in their ability to facilitate community participation in deciding what types of services should be requested of GOG agencies.

Evaluation:

According to implementation plan, there should be 1500 promoters. There are 299. Because of the limitation on

size and quality of staff in the Secretariat and lack of support staff in the field, the BRE program infrastructure is still being developed. For example, a viable research/evaluation feedback system has yet to be installed. Likewise, the radio component of the NFE delivery system has not evolved as planned. Reports show that the radio messages are not supporting or complementing the work of the promoters. Presumably, the radio messages alone are not having a significant effect on the target audience as listenership has been reported to be as low as ten percent. This is important because it was originally believed that the principal medium of the program would be radio. Other key program components (materials design and production and training) have not developed as planned.

Over the past 17 months, approximately 15,000 individuals became direct beneficiaries of the program. In 1979, 10,200 were served - 7,200 in the Western Highlands (three departments) and 3,000 in the Central Highland (three departments).

Most projects and activities have centered in the areas of agriculture, health and housekeeping practices; water supplies for agriculture and home use, environmental sanitation, skills training and literacy.

According to the initial work plan, the program should now be serving some 240 communities and 100,000 individuals - the difference is attributed to lower than expected number of promoters being available to the program and to the terribly

underdeveloped radio component as the primary medium of communication.

While radio messages are broadcast daily for 30 minutes in two highland departments, there is less than adequate coordination between radio messages and the work of the promoters. Radio is supposed to have two functions in the program: (a) it must reach people where promoters and/or inter-institutional technicians are not available on a regular or continuous basis; and (b) it must be facilitating the work of the promoters in areas of intensive treatment. (Treatment ratios are 1:30 - promoter to participants.

In sum, it seems appropriate to look at the quality and summative evaluation of the project in reference to the BVE Project that was the forerunner to the Basic Rural Education Project. Quoting from a recent USAID/Guatemala Evaluation report (of highly restricted distribution), we see that the project is not doing nearly as well as the BVE.

At this point and in all fairness to the contractor, it is important to indicate that due to many internal GOG jurisdictional problems, the experiences and physical and human resources developed through the BVE project have not been made available to the program and thus have had little or no bearing on the development of the BRE program. This is unfortunate and beyond the control of both the contractor and USAID. As shown by the BVE experience, the radio/promoter combination is the most effective means in bringing about developmental change in areas of low levels of modernization. This is why radio was designed to be the key element in increasing the coverage of the program. At the same time, it is important that even though radio can help in many ways, e.g. combining education with entertainment, transmitting new information to non-readers in order to crystallize

attitudinal change (as BVE illustrated), it needs the more personal, more direct input and follow-up of the promoter.

In essence, the BRE project is really not as effective as USAID would like or as effective as its parent project the BVE project. To bridge the gap with what was and what is needed is a system with exceptional methodologies for getting people involved both at the policy making level - thus the promoters will be hired - and at the community level where the dynamics of the program have to be affected.

## THE RURAL RADIO EDUCATION PROJECT - PARAGUAY

The Rural Radio Project is a major effort in Paraguay to use radio and other media to compliment primary education. The project provides radio and instructional materials in the areas of language, arts, science, and mathematics. Six phases of the project have been identified:

1. Planning, pre-testing of instructional radio.
2. Preparation of and pretesting radio curricula and educational materials.
3. Establish a message radio delivery system through radio programming, monitor support and learning centers.
4. Installation of radio stations and transmitting programs through commercial radio stations.
5. Conducting a formative feedback evaluation.
6. Completing a final summative evaluation.

Specialists in radio, education, research and evaluation, supplementary materials production and radio script-writing have made certain significant achievements:

1. Designed special curricula for media presentation. This includes 540 different instructional programs. This also includes additional material of the printed variety that serves as support and clarification to the radio program.
2. Professional development training. Educators in the host country have been trained to produce and direct the radio series. They are also trained in the production of the various accompanying printed matter.

3. Research and analysis. The student population being served has been analyzed and their listening/learning habits reviewed so that the materials presented might be more viable.

It is interesting to note that a circular system was developed in which the information and the feed-back travel over what appears to be open channels. The first stage or station in the circle is the project planning, which involves pre-testing on site. This is a very important stage as it is from this special information that the population is first understood. The second stage is curriculum and materials development, developing and testing radio curricula and educational materials that accompany the broadcasts. The third stage or station in the circle is message delivery. It is here that the actual radio program is delivered and that the monitors at the sites coordinate the reception and the dissemination of information. The last station in the system is the evaluation phase which is both formative and summative. Here the circle moves again and reencounters the first stage: planning, redefined now and modified by input.

It has been found that the monitor is a very important link in the system. The role of the monitor was originally underestimated, but was quickly corrected during the planning phase. Monitors have a multiplying effect on the material and even on their own presence. This arithmetic progression towards a positive condition in the learning system can not be over estimated.

Statistics on performance are interesting. There were 35 learning centers with 700 students enrolled initially. During the school year 1978, 111 students dropped out of the radio courses. At the end of this term 589 students were given achievement tests in all three subject areas. 88% passed this examination. The following table shows the statistics on the student performance and should be examined carefully for reference and indication of effectiveness.

Student performance during different stages of the project

Regions	Enrolled		Drop-out		Examined		Passed		Failed	
	M	F	M	F	M	F	M	F	M	F
1	45	55	6	6	39	49	34	45	5	4
2	56	54	21	8	35	46	30	36	5	10
3	44	47	4	-	40	47	31	43	9	4
4	35	70	4	9	31	61	29	56	2	5
5	78	40	11	2	67	38	58	32	9	6
6	29	47	11	11	18	36	14	33	4	3
7	41	59	13	5	28	54	28	51	-	3
TOTAL	328	372	70	41	258	331	224	296	34	35
T. Gen.	700		111		589		520		69	
	100%		16%		84%		100%		88%	

The 16% drop-out rate is most significant when compared with the rate for other formal education programs. These rates varied from 28% to 54% during the 1970s. By comparison, the Rural Education Program was most successful in retaining its students.

It is very important to remember that this radio education project was used for FORMAL education while some of

formal education. The effectiveness of radio for the adult home learner as a possible exception of the "formal" education is also interesting. It appears clear now that radio in a multi-media format can approach almost any education need and be effective as an information system. However, the salient factor related to program success is the use of monitors. The Rural Radio Education Project placed such stress on training and assessing individuals whose responsibility it is to bridge the information transmission.

## RADIO SANTA MARIA - DOMINICAN REPUBLIC

Radio Santa Maria was an innovative combination of radio programming, printed materials and field teachers. Sponsored by the Catholic Church, it was designed for leisure time programming, following the culture, concerns and characteristics of the people it served. RSM had its origins as a small cultural-religious broadcasting station in the Cibao Valley of the Dominican Republic; it was created and developed by Jesuit Priests. It gradually expanded to a 10 kilowatt commercial-educational station with the largest audience in the densely populated region. RSM was preceded by a radio instruction program based on the ACPO model in Colombia for adult literacy from 1964-1970. In 1970 under a new director (Father Abezas), an analysis was done of the needs of the people and the potential of radio broadcasting. It was concluded that conditions were changing in both rural and urban areas and that a new model was needed.

The RSM model was originally directed at adults, particularly young adults (later to include adolescents) of lower class background so as to enable them to take advantage of new economic opportunities resulting from an expanding economy. However, RSM was also designed not just by purpose, but by method, to encourage the students to become involved in and become leaders in the social development of their country. To accomplish this, RSM designed an

accelerated program (4 years) of grades 1 through 8 while encouraging young adults to employ more technical methods of agriculture and enter secondary schools or obtain skilled urban employment. The RSM school was more exacting in content and method than the traditional schools. Their coordination with the Secretariat of Education in regard to content and examinations enabled students to receive the same official diplomas and thus enter secondary schools. The program employed self-directed learning and encouraged the individuals' analytic abilities. The course content was appropriate to the psychology and life context of poor, rural young adults and sought to motivate and equip them for participation and leadership in community organizations. It also included non-formal educational material in agriculture, nutrition, home-making, health and child care.

There was a one hour daily broadcast Monday through Friday explaining the material with a set of six to eight attractively printed lesson sheets, one for each subject covered. Field teachers corrected the exercises and answered questions. This person also handled administrative tasks, such as enrollment, tests, fees, etc. There was no formal school as such, since the students listened in their homes.

This appears to be a strong element in the program, following the findings of the Paraguay project, concerning student preferences and their corresponding academic achievements. Teachers were responsible for a flexible sector which could stretch as far as 10 kilometers in distance. There

were weekly meetings for student groups to correct lessons, answer questions, provide examinations, etc. A central part of this interaction was a social question posed as central theme of the various subject matters during the week.

RSM broadcasts other general educational and cultural programs for different age and occupational groups to supplement and support the more formal educational process. The project maintained no staff for promotion and worked closely with existing organizations. Activities of these organizations were considered by all as extensions of the RSM formal educational courses. In 1976, there were more than 520 field teachers (sectors), new field offices near the Haitian frontier and in the capital (Santo Domingo) and arrangements with five other radio stations for broadcasting. Each year since 1973 around 13,000 students have successfully completed a grade (1 through 8) and in 1976, 4000 received 8th grade certificates.

RSM had a staff of five broadcasting teachers, two artists, and a director; each teacher specialized in one subject so that there was vertical integration of the subject matter. A new set of lesson sheets was designed each year. The lessons are continually improved on the basis of experience from the previous year. The teaching staff maintains constant feedback concerning the students' comprehension through weekly reports from the field teachers and staff visits to various sectors. It is possible to adjust the lesson, exercise sheets and broadcasts week by week. There

is a weekly meeting to discuss the material and feedback on student problems. RSM programs are designed to train the students to be active and creative in getting knowledge and in integrating it into their lives.

The RSM system for feedback and curriculum change and the active role of the students compare favorably with the Nicaragua Radio Mathematics Project, which used weekly tests and observers in the field. However, RSM is not part of a formal school setting so that it reduces costs even more dramatically while covering all primary subject matters. RSM also differs from the Radio Mathematics Project in that it did not arrive at a finished curriculum after one year, but continued the evolution of the programs both refining them and changing them to meet sometimes rapidly changing social and economic conditions. Also, there was a focus on young adults, who are highly motivated, to help them relate their learning to their life contexts. (One advantage of the Nicaraguan Mathematics Project was the almost total elimination of printed materials and the use of realia, such as pebbles and grain for counting, etc.). The RSM staff in fact concluded that the lessons should be more derived from student concerns, rather than adding the central theme to the preselected subject matter, usually by project staff.

RSM was quite successful academically. RSM students in 6th grade have higher median scores on certificate

examinations than 8th grade students from traditional classrooms.<sup>6</sup> RSM urban students do better than rural students only in 8th grade, yet the rural RSM students do better than the urban traditional students across the board. The competence of the field teacher is the key element in the academic achievement of the RSM students, particularly in mathematics but also in subjects such as the natural sciences which depend more on printed materials. The longer students are enrolled in the RSM program, the higher their comparative median scores are, particularly with good field teachers in social studies.

The RSM cost per student was about 60% of the cost per student in traditional settings for each of the years covered. Initially the cost per student was \$29.15 for RSM compared to \$48.74 for traditional schools; in 1976, it was \$38.91 compared to \$62.44. The actual increase in cost was due to inflation and the RSM staff believes that their policy of evaluating each innovation or extension in terms of academic achievement is paying off. RSM is comparatively more economical because of reduced personnel, particularly field supervision and professional teaching staff. The more economical use of limited resources is coupled with equal or higher academic achievement, while educational opportunity is provided in remote rural areas. Finally, this is accomplished

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in a context stressing integration of formal education, community participation, family and work; this is truly a notable achievement.

One major lesson of RSM is the benefit of self-support with the independence and self-initiative that come with it. This argues strongly for the establishment of a radio instructional system which will be controlled by non-governmental sources, national or international. This is reflected in the programming itself which emphasizes central themes appropriate to the concerns of the recipients, including social and community participation. The small student fees also reflect this philosophy of ownership and insures a higher level of mutuality between students, teachers and program staff.

## RADIO PRIMARIA - MEXICO

Radio Primaria was established in 1970 by the Secretary of Public Education in Mexico City. The program was designed to increase the number of primary schools offering instruction in grades 1-6. By reinforcing the teacher's work, it enables one teacher to teach the three higher grades, so that four teachers plus the radio broadcast can cover the work of six teachers. Radio lessons are broadcast for an hour and a half of every five-hour school day. Originally directed towards the three higher grades, since 1975 they have been designed for the fifth grade. In that year, 2,075 pupils in and around the city of San Luis Potosi were served. The stated goals of the project were:

1. The children of school age who live in rural communities and attend schools of less than six grades be able to complete their primary education in the ordinary time of six years.
2. As an extension of the project, the opportunity be given to persons of above 15 years of age who for various reasons did not finish their primary education, to complete their studies as informal students.

The second goal of Radio Primaria has existed only in principle. Radio Primaria has focused on the classroom. The basic idea of introducing radio into the schools has to make up for the lack of money to hire sufficient staff. Although the actual situations in the existing radio schools

differ quite a bit, the idea behind Radio Primaria was for a six grade school with four teachers. Three teachers would be handling the first three grades the traditional way without radio; the fourth teacher would have the three older grades in one classroom and teach them with the assistance of the radio lessons. Thus by supplementing the teachers who are now in the school system, not by replacing them, the radio system is meant to allow the full primary course to be taught where it has not been taught before and where its prospects for ever being taught were dim. The saving involved is the lower cost of Radio Primaria compared to the salary of two more teachers.

During the school year, five or six programs are broadcast each day. Each program lasts fourteen minutes. For the most part, the programs have been nearly the same in each of the years that Radio Primaria has existed. Programs are taped by a team of eight radio teachers in studios in Mexico City and are shipped by bus to San Luis Potosi to station XCXQ, the radio station of the university of San Luis Potosi where they are broadcast without charge Monday through Friday, 9:00 a.m. until 12:45 p.m. On the average, in a five hour school day, an hour and thirty minutes are taken up with radio lessons. Eighty percent of these lessons are for all three grades. For the other three and one half hours, the teacher directs the class with work activities initiated by the radio. The classroom teachers receive bi-weekly a document called El Correo de Radio Primaria, that contains the

schedule of radio classes for the next two weeks. It also contains detailed directions for learning activities done by the teacher or students, or both, before, during and after the radio broadcast. It suggests teaching material that can be made or that should be on hand for each lesson. At times, the teachers receive visual materials, maps and pictures for produced for instructional purposes. The interesting facet of Radio Primaria is that radio is used to stretch the efficiency of the rural teacher so that with the same number of teachers plus radio, more children can be offered the full six grades of primary education.

A number of problems have confronted Radio Primaria. There have consistently been important hardware administrative problems in San Luis Potosi. Radio Primaria depends on radio receivers that are bought and maintained by the teacher or the community. When electricity is lacking, or batteries depleted, or hills obstruct reception, or classroom acoustics are poor, or radio speakers are squawky, the children do not benefit. In some schools, haphazard maintenance hinders continuity in the radio classes. The lack of a central agency to issue receivers of quality becomes a felt need for anyone who visits radio schools.

Administratively, Radio Primaria has had most critical problems. Each school zone has its own inspector who is charged with regular visitations. The inspector is not provided with a vehicle for this travel, or so far as anyone can tell, expenses to maintain his own car. The countryside is

very rough so that maintenance expenses are higher than normal. To inspect the most rural of approximately 50 schools in each zone, an inspector would have to drive two hours one way though other schools would be closer. In three and a half months visiting schools, Peter Spain in his analysis of Radio Primaria crossed paths with an inspector only in two sites that were very close to San Luis Potosi.<sup>7</sup> It is likely that the inspectors were not doing extensive visiting, thus the necessary link between the schools and central programming does not exist.

While the findings of this project are somewhat mixed, it must be noted that it is hardly a well controlled experimental situation. Lacking adequate resources, supervision and hardware, Radio Primaria has encountered a number of difficulties. Radio Primaria can be viewed as a project facing numerous pitfalls resulting from underdevelopment. It is more than a hardware system in that it calls for support structures in an organization in which it can be fitted. However, the infrastructure needed to introduce technology does not readily exist. Cost of investments required is prohibitive and it is impossible to train professional personnel and develop facilities required in such a short time without adequate resources.

<sup>7</sup> Spain, Peter. The Mexican Radioprimary Project in Radio for Education and Development: Case Studies. Washington, D.C., The World Bank, 1977.

Spain conjectures that too much is being asked of rural education: Too much is being asked of radio. Technology can sometimes aid in the solution of a problem. It can also serve to keep the problem at arm's length. Instead of sending people into the rural areas to organize and educate, and draw out the human resources that are there, technology is used but it is not the same. Radio Primaria was designed and implemented because the price of direct teacher systems was too high. While Radio Primaria may educate as the direct teaching situation does, it has been observed to be far from the solution to the more basic problems of development and in itself to achieve even the limited objectives of rural education.

## TECHNICAL FEASIBILITY OF RADIO BASED INSTRUCTION

The Radio Community Basic Education project should take into account a number of technical considerations. These considerations include: 1) availability of transmission and reception hardware; 2) skilled engineering personnel to assure problem-free transmission; 3) host country governmental cooperation and assistance; 4) trained program personnel both in central programming and the classroom and community; 5) program production, broadcasting and evaluation; 6) provision of necessary support services; and, 7) continuation of the project after AID funds are exhausted.

### 1) Availability of Transmission and Reception Hardware

The RCBE project will utilize an existing AM radio station to transmit programs. By purchasing air time, the project will avoid the cost and technical difficulties of constructing a new facility. Although transmitters can be purchased and installed for as little as \$20,000 (for a five watt transmitter, tower and rudimentary program production facilities and hardware), it is much more desirable to utilize an existing facility.

To be commercially viable, an existing station would require adequate staff and production facilities for maintenance. Also, there would be enough radio receivers to ensure a listening audience. Finally, regulations and

licensing dealing with radio transmission are rather complicated and cumbersome; hence, the need to use an existing broadcast facility.

2) Skilled Engineering Personnel to Maintain Programming Facilities

The probability that technical personnel would be available to operate and maintain broadcast facilities would definitely be higher if an existing station is used for the RCBE. If the project encounters consistent maintenance problems, then a staff upgrading and training effort will be considered as a pre-service and in-service option for technical personnel. This factor should present few if any problems, since radio transmission technology is prevalent in most less-developed countries.

3) Host Country Governmental Cooperation and Assistance

Perhaps the most important technical consideration deals with administrative feasibility of the RCBE. From the outset, the project must rely heavily on host country governmental support and cooperation. Radio program success, i.e., longevity and effectiveness, has been directly related to the involvement of governmental or other administrating agencies from the outset of the project. For example, a major problem cited in Basic Rural Education project analyses has been the difficulty in achieving interagency cooperation. But then, interagency

cooperation is difficult to achieve in any project, in any country and under any circumstances.

The RCBE will require significant involvement and cooperation from the selected country's ministry of education. Some instructional programs will be drawn from nationally articulated curricula objectives, all programming must have the approval of the education ministry. The seed money for the five-year single-site project is expected to lead to national replication, the cost of which must be born by the host country.

A great percentage of the RCBE programming will be directed to in-school youth who are being served by the ministry of education. In addition, learning support materials will require preparation, distribution and supervision by the educational agency to a limited degree at the outset and completely at the termination of the project.

Clearly, the importance of an effective, capable, and willing department or ministry of education cannot be ignored in determining project site and carrying out the effort. Without a comprehensive, trusting crosscut between AID, the contractor and the educational agency from the start, the project will likely encounter significant problems.

Cooperation can be elicited in the following manner. First, AID mission personnel in potential country sites will be consulted to evaluate the administrative capability and organizational climate of the national education agency. Second, a presentation will be made to selected educational personnel at all levels of administration - from teachers to policy administrators. Reactions to the presentation will provide further evaluation input to guide country selection. Once the country, site and host country subcontractor are selected, it is important to conduct continuous planning and advisory functions, again involving as many levels of educational services as possible.

Since the RCBE is being established as a research and demonstration function, the educational agency must be aware from project initiation that an increasing percentage of financial participation will ultimately result in the ministry's takeover of the project. If the agency is aware of its future responsibilities then perhaps the project will not simply be considered as an administrative novelty which might provide short-term funding for excess staff and to purchase equipment. Thus, the RCBE effort will rely heavily on AID mission assistance and on exhaustive evaluations and presentations to assure that the project be established with quality and permanence in mind.

4) Trained Program Personnel in Production, Programming, Community and the Classroom

While there have been a number of successful radio instruction projects from which to assimilate a radio instructional model, it is likely that few host country personnel will be professionally prepared to administer the RCBE. There will be three principal levels of personnel involved in the project: central programming staff, including personnel involved in production and supervision of programs; regional coordinators of field activities; and community instructors/coordinators. It will be necessary to train personnel in each of these functions.

Program producers and supervisors will require graduate level training in instructional broadcasting, instructional theory and multi-media program delivery. This will be carried out in the United States. In addition, these personnel will complete a short-term instructional administrative practicum in one or two countries currently sponsoring radio instructional programs.

Additional training and technical assistance will be provided throughout the project by short-term consultants. Upon completing the training phase of the project, production and programming staff will be able to design, implement, manage and evaluate a mixed-media, basic

education program relying on radio as the principal medium.

Field/regional coordinators will also require training. Radio Primaria exemplifies the negative results of lack of supervision and monitoring. Since the role of field inspectors is crucial to the RCBE project, they will be trained in the following specialties:

- \* Instructor pre-service and in-service training
- \* Radio broadcasting and instruction
- \* Multi-media programs
- \* Classroom observations
- \* Test administration, and
- \* Management of communication between community schools and central programs.

Instructor/community coordinators will, of course, have the most important delivery role in the project. They must receive professional training so they can supervise and evaluate classroom activities which are integrated and complementary to radio programming. It is important that instructor/coordinators be trained in how to use radio programs as a central element to the instructional process and that they can fuse follow-up, radio-directed activities to stimulate an intensive learning environment.

5) Program Production, Broadcasting and Evaluation

A radio based instructional project has much experience, precedent and resources to draw from. The RCBE proposes to provide basic literacy, decoding and numeracy training along with other general subjects. It will be necessary to create and adapt much instructional programming; however, there already exists a wealth of quality programs in nations using radio instruction. The RCBE would draw heavily from the Radio Mathematics project, Radio Primaria and ACPO. Emphasis will be placed on lively, interactive programming with well designed resource materials to stimulate hands-on application. By adapting the interactive model developed in Nicaragua, all instruction will follow a similar format. In most cases, we can translate from well designed basic educational modules in English.

One should also consider the quality of the primary curriculum in the country selected. Since the RCBE will be an integrated program in the national primary curriculum, programming will draw heavily from existing host-country instructional resources.

Evaluation of the RCBE must be rigorous, timely and valid. Since this project does constitute a research and development effort, its function is to demonstrate, test and revise according to need. Those revision needs can only be obtained through effective evaluation of all elements of the project.

6) Provision of Necessary Support Services

The major conclusion to be drawn from previous experience is that radio is most effective when used as one element in a mixed-media approach. Programming may be accompanied by newspaper (ACPO), supplementary lesson plans (Radio Mathematics project), monitors and technical extension personnel (BRE and BVE), and flip charts, other graphic aids and printed materials (Radio Primaria and Radio Santa Maria). Indeed, radio programs have tended to be only as successful as the quality of support services provided to the target audience.

This is an especially important technical consideration in the RCBE project. Basic education, to be successful, given the conditions of the target population, must offer a complete mix of stimuli, content and interaction. It will be necessary to have duplication facilities to print extensive amounts of material. Graphics production will be required to produce audio visual programs and materials which serve to complement instruction delivered through the radio.

A distribution network will be established to send along advance descriptions of program content, necessary materials and audio-visual support resources. (A number of strategies for creating and utilizing home-built audio-

visual equipment with very little cost have been developed. These strategies circumvent the need to purchase and maintain equipment rarely found in schools in less-developed countries. Instructors will receive training in how to create their own equipment). Any needs or observations which instructors may have will also feed into the distribution network.

Continuous communications will be maintained between instructors and the central programming center. Weekly reports will note evaluations of student performance, as in the Radio Mathematics project; student evaluation of radio and classroom instruction; and instruction evaluation of radio instruction and support services. Thus, the communication infrastructure of the country selected is an important technical consideration. If schools are inaccessible, as in Radio Primaria, or the postal and transportation system is non-existent, then a nation should not be considered as a viable site for the project. There must exist a modicum of communication services to assure effective distribution of support services and communications.

7) Continuation of the Project after A.I.D. Funds are Exhausted

Some of the more important measures of research/development project success on continuation, replication and

expansion. If this is to occur, project activities should be evaluated rigorously and objectively for flaws, slippage and deficiencies. A project seeking to be continued should from the outset establish its status as a pre-test effort leading to permanence.

In several of the projects noted in this report, radio instruction was introduced and operated by outside contractors. Host country involvement was of course solicited and relied upon; however, actual programming was directed and controlled by U.S. expatriates.

Although the programs were successful in meeting stated goals, continuation was difficult without sound support by a host country agency.

The purpose of the RCBE is clearly one depending upon continuation and expansion. It has been amply documented that radio instruction is technically and economically feasible: it is not the intention of this project to test that notion further. The project will demonstrate, for the first time, that radio instruction can effectively augment a mixed-media educational program aimed at improving basic skills in literacy, decoding and numeracy. To that end, a model will be created, implemented, evaluated and expanded through close cooperation with the host country participants.

## ECONOMIC ANALYSIS OF RADIO BASED INSTRUCTION

Development assistance agencies, AID prominent among them, have renewed their commitment to educational technology, particularly radio instruction, as the least costly, most successful approach to attacking illiteracy and its accompanying problems.

There is no question that any economy benefits from an educated populace. Radio instruction is an excellent strategy for increasing basic education skills for a larger number of persons in isolated rural settings. In addition, radio can assist in imparting coping skills essential for improving the quality of life.

A consensus derived from reports of radio instruction programs through underdeveloped nations is that radio is a cost-effective educational strategy. It is less costly than traditional educational technique in terms of outlays for hardware, for personnel, and for number of students reached per unit cost of instruction.

The following chart shows the variation in cost of radio instruction programs as compared with traditional education costs:

	<u>Radio Delivery Cost per Student per Month*</u>	<u>Face to Face Instruction per Student per Month*</u>
Nicaragua (Radio Mathematics Project)	3.86	7.44
Dominican Republic (Radio Santa Maria)	3.25	5.15
Mexico (Radio Primaria)	13.12	24.83
Mexico (Tarahumara)	42.20	68.40
Thailand	3.47	-

Radio instruction is particularly appropriate for efficient utilization of seed money in an LDC context. Funds can be utilized to procure software and to develop the manpower and technical capacity for implementation. Once these factors are in place, continuation and maintenance require expenditures at a level potentially feasible for the most economically limited nation to supply.

From the standpoint of cost, radio program production can range from simple, two and three-person studios, to a national network employing thousands of people, such as in Colombia. In most cases, operation of a radio station requires at least some qualified engineering and production

\*Methods of estimating costs vary widely as the programs themselves. Dean Jamison has discussed these techniques in several works, including Cost Analysis for Educational Planning and Evaluation: Methodology and Application to Instructional Technology. Princeton, N.J., Education Testing Service 1976.

staff. Even so, the costs of operating even a large radio station are insignificant in relation to the number of hours of transmission and the potential size of audience. Once a transmission station has been established and begins transmitting, its operation can be highly automated requiring only a few staff in each transmission station.

Radio is an ideal vehicle to reach isolated rural people because of mass production and increasing low cost of receivers due to electronic advances, such as the chip and transistor. In just about every country in the world, one can purchase a cheaper model of a radio for less than \$20 Dlls. Currently, in less developed countries, there are an estimated 75 million radio receivers, or one for every 20 to 30 people. In most countries there is at least one receiver in every home. Radio therefore has a capacity to reach the majority of the population in almost every country of the world. Furthermore, radio receivers operate on low power, can be powered by batteries, and are not dependent on established electricity supplies, which is often absent in rural sections of less developed countries.

A number of factors affect the economy of radio instruction. There are several costs which have to be taken into consideration: development, production, distribution, and instructional support costs.

Development costs are those that are incurred in designing and producing new equipment, such as the creation of a radio station, and the development of instructional materials

Obviously this cost can be minimized if there is a radio station already functioning in the site selected from which air time can be purchased. Significant developmental and production savings can be effected if materials already in use in other countries can be adapted for programming. The Radio Community Basic Education project would draw heavily from previously developed materials, including those utilized in the Radio Mathematics Project in Nicaragua, APCO in Colombia, the Paraguay Radio Project and Radio Santa Maria in the Dominican Republic. Within the realm of non-formal education, the radio/community basic education project would draw from instructional material developed by Basic Village and Basic Rural Education Projects in Guatemala. In addition, there are a host of other radio programming materials from throughout the world which can be utilized. For example, the Thailand Radio Project is translating and amplifying upon materials developed for radio in the Nicaraguan project. Similarly, there are materials available in Brazil, the Philippines and Korea. In addition, there is an abundance of programmed learning materials available for grades K through 6 in the United States which can be easily translated into any language required by the project.

Distribution of radio waves is a relatively cost-free function. Insofar as reception costs are concerned, the project need only concern itself with the availability of radios and a source of power, either batteries or electricity.

The cost of providing paid instructor/coordinators for instructional groups or classes will also make a large difference in the overall cost of the radio project. However, in most cases instructors will already be at work, whether or not there is radio programming. A radio station once established has comparatively low operational costs, mainly salaries for production and technical staff, plus occasional replacement of equipment. However, support services have comparatively high operational costs which will vary according to the population of the target audience. Obviously, the larger the audience the less cost per person served.

The relationship between AID and the host country administration will affect the RCBE. In the past a number of pilot efforts have fallen short due to inadequate interface between external and host country funding agencies. For example, UNESCO and UNICEF funded an educational radio project for six years in Afghanistan. When external funding ceased the Afghan government continued to fund the operation of the radio station and transmission, but did not provide a budget sufficient for the purchase of paper supplies or for the maintenance of support services. Within three years of the end of external funding, no one at the production center knew whether any of the radio schools were still operational. Teachers were in many cases unaware that programs were continuing, since there were no longer teaching manuals being supplied or even printed program information available.

One must recognize that in less developed countries which have had radio projects, the system of accountability and budgeting is such that it is very difficult to assign realistic costs to instruction and support services. Nevertheless, despite the difficulty of giving precise costs, there is no doubt that the cost of support services usually is a major component in the budget of a radio project. Instructors/coordinators must be supplied and trained, carrier services from the central radio programming facility to the project communities must be provided to distribute written programmed materials and learning resource materials. Teaching guides, plans and handbooks must be provided, instructors and comprehensive evaluation services should be administered to insure that the programming is effective, timely, and being used.

In his in-depth study entitled Cost Factors and Planning Educational Technology Systems, Dean Jamison offered a comprehensive cost analysis of a number of radio projects. He found a wide variety of cost figures, the difference being primarily a function of the method used to compute the cost per subject. There was, however, substantial evidence that most radio projects are less expensive than equivalent traditional methods of education. Indeed, for many students using this vehicle, radio instruction systems are the only available methods for studying. Since the cost of both electronic and print media are declining relative to the cost of teacher time, cost advantages for radio instruction can be expected to increase in the future.

The most controllable factor in cost effectiveness according to Jamison, is enrollment. For a radio instruction project to succeed, it must be assured of an appropriate minimum number of students over an extended period to have a substantial impact on the learning process. In the case of Radio/Community Basic Education project, AID will establish and create a mechanism or strategy, as opposed to a refined, completely cost-effective instructional program. Hence, in its initial phase, just as in any pilot project, the RCBE will be comparable in costs to traditional face-to-face instruction. It is in the application of the strategy or concept to a broader target population that cost effectiveness can be realized.

The Community Basic Education project has selected radio as an instructional vehicle for several economic reasons: to reduce costs per student; to improve educational access for isolated persons not being served by instructional programs; and appropriateness of instruction being offered in the formal school system. Enlightened, interactive programs can be transmitted cheaply from a central source which will directly impact upon thousands of students. Many of them could never be reached through traditional techniques. The project will bring program quality to school and not simply depend upon instructors in the field to carry out innovative lesson plans. Programming will be geared in such a way as to impact upon all children, although emphasis will be made to teach to those in formal school settings.

Radio can be given a favorable cost rating, but evidence suggests that radio alone is insufficient to accomplish learning tasks, rather it must be built into a learning resource system combining study discussion groups, formal classroom settings, printed materials, and other media, supervised by an instructor/coordinator.